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# 12

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# California M E D I C I N E

OFFICIAL JOURNAL OF THE CALIFORNIA MEDICAL ASSOCIATION

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## Physicians in Politics— as Good Citizens

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THIS is an election year of high political voltage in California and in the nation, and most doctors I talk to are taking their politics seriously. I think that's fine, because doctors, like all good Americans, should first of all be good citizens.

Some people have criticized doctors because, in the course of their nationwide battle against socialized medicine, they have descended from their ivory towers and entered the world of public affairs. The critics who call for the doctors to return to their towers, of course, have been on the losing side of the battle.

I think doctors should not withdraw from the field of active citizenship, and I believe they will not. One of the wonderful things that happened to doctors in the course of their fight has been the realization that the fight really is just a skirmish in the over-all fight to uphold basic American principles above the muddy flood waters of socialism, communism and fascism that have engulfed so much of the world.

Doctors, I believe, owe a great debt to the many thousands of individuals, community groups and national organizations that allied themselves with medicine's cause—to legislators and laymen, to leaders of other professions, to those businessmen and labor leaders who spoke out to defend a free profession from the threat of political domination. Individual doctors who concern themselves with politics are partially repaying that debt, for they are carrying the fight for freedom beyond the field of narrow self-interest.

The physician is trained always to observe and respect the law of cause and effect. He knows that an untended cut will result in an infection. He knows that if a cancer is not removed, the patient will die.

Most of us, in dealing with the problems of our daily lives, pay due attention to that law. The farmer knows that if he plants barley, he can't expect to reap wheat. He can't expect to harvest oranges from his peach trees.

Yet the social planners of our era—the starry-eyed promoters of economic Utopia—insist on ignoring and breaking the law of cause and effect. They would have us believe that if we plant the seeds of tyranny, we will reap wealth; that if we plant the seeds of socialism, we will have liberty.

### NATURE'S EMPHASIS ON THE INDIVIDUAL

Let's examine briefly the economics of the world we live in from the viewpoint of the biologist. The biologist, whose job it is to study living organisms, never ignores the law of cause and effect. He deals with things as they are—not as he might imagine or even prefer them to be. Nature, the biologist knows, has one basic, changeless principle. It is the principle of individual responsibility: *individual reward for individual merit and individual penalty for individual failure.*

Nature's unvarying emphasis is upon the individual member of a species. Her sole use of group action is to afford the individual an opportunity for development and to protect him against attack by other species or groups, or by other individuals in the same group. The whole evolutionary process has been directed toward improvement in form and function of the individual. In all of the 800 million years of evolution, *during which Nature commenced with an ameba and achieved a Mozart*, she never varied from the underlying principle of individual responsibility. Our social planners—blithely flying in the face of Nature—exalt the glory and power of the group over the worth and dignity of the individ-

Address of the President of the California Medical Association upon induction to office at the meeting of the House of Delegates, Los Angeles, April 27, 1952.

ual. Our basic American principles, the planners tell us, are old-fashioned—even "corny." Yet the reason why the American system has been so enormously successful—why perhaps for the first time in recorded history one generation after another has grown to maturity and given way to the next without knowing what it is to starve—the reason is that our system was founded with due regard for Nature's laws. The Declaration of Independence asserts as God-given rights, not as government-endowed privileges, the rights to life, liberty and the pursuit of happiness—not happiness, mind you, but the individual pursuit of happiness. That cornerstone of our American way of life reaffirms Nature's deep regard for the importance and dignity of the individual, rather than the group, or the state.

On that foundation, America grew to moral and material greatness, under a system of free enterprise—a system that permitted men to buy or sell, to work for themselves or others, to compete or cooperate according to their preference, so long as they proceeded by voluntary agreement and did not resort to violence or fraud.

That economic system, which has produced such a wealth of goods and inventions and raised man's standard of living beyond his wildest dreams, ideally conforms to Nature's laws. We have only to dip into our history books and glance at the present world around us to know that beyond any question that system has accomplished the greatest good for the greatest number of any system ever devised by any society in the history of the world.

Yet because under this system everything is not always perfect for every person at all times, the social planners—both the evil-intentioned schemers and the well-meaning do-gooders—urge us to abandon it in favor of systems based on group action, or collectivism.

#### COLLECTIVISM DEFIES NATURE

Nazism, socialism, fascism, communism—all forms of collectivism, rest on the basic premise that the individual is of little or no value and that the group or the state is of paramount importance. Karl Marx's dictum, "*From each according to his ability, unto each according to his need*," typifies this thinking. This philosophy and its practical application in group action permit the individual to diffuse, deny, and evade his personal responsibility by merging it with that of the group or state. Such avoidance of personal responsibility exists nowhere in Nature's plan and is therefore a direct violation of her fundamental rules. The biologist would expect such conduct in human society to fail. And it has failed, time and time again.

There are many spectacular examples of failure in ancient times:

In 2285 B.C., Hammurabi, the Babylonian, imposed upon his people the most elaborate set of codes covering every conceivable economic and social activity. The experiment was short-lived. It did not produce a stable society, nor did it encourage production and distribution.

The Roman Emperor Diocletian, in 301 A.D., put the government into every phase of the citizen's existence and thereby so weakened the Roman Empire that it fell a ready prey to invasion just a few generations later.

In 1058 A.D., in China, the emperor of the Sung Dynasty was faced with economic and political difficulties. There were present all the symptoms of a maladjusted economy which inspire our modern intelligentsia to reckless surgery on the body politic. There were over-production and under-consumption, improper distribution of wealth, privilege in high places, economic royalists, and *two-thirds* of the nation were *ill-fed, ill-clothed* and *ill-housed*. The emperor called in the number-one brain truster, a man named Wang-an-shih, who put into effect sweeping New Deal reforms. Prices, wages and hours were fixed, crop quotas were established, excess crops and animals were destroyed, the ever-normal granary was established, and the currency was devalued. Naturally, the physicians were placed under government control. *Do these tactics sound familiar?* And the results: The experiment lasted for about ten years, at the end of which time Wang-an-shih was forced to flee the country to save his life.

In modern America, particularly in the last century, numerous experimental communities were established along basically communistic lines. Some of the more outstanding were Brook Farm outside Boston, the New Harmony Colony at New Harmony, Indiana, and the Oneida Perfectionists at Oneida, New York. These colonies all pooled resources and assets and followed the communist doctrine of "*from each according to his ability; unto each according to his need*." All of them, after a short trial, either failed or altered their organization in such a way as to reflect individual responsibility and encourage individual initiative. During the heyday of the New Deal, the economic planners killed 6,250,000 little pigs, 875,000 cows and several hundred thousand brood sows, in addition to ploughing up millions of acres of corn, wheat and other crops, and destroying crops already produced. The quaint notion behind that program was that by destroying part of that which we have and making it difficult or impossible to produce more, we would all have a greater abundance of goods and services to enjoy. Government intervention stems from the fallacy that high prices are an indication of prosperity and well-being, when as a matter of fact, they merely indicate a lowered availability of the products involved, and therefore a lower living scale for all of us.

The social planner believes that the state should relieve the individual of responsibility in almost every phase of human activity. The biologist, who has made a study of Nature, believes just the opposite. He believes that the founders of this republic were on sound ground when they sought to limit the powers of government. Thomas Jefferson, in his first inaugural address, said, "Restrain men from injuring one another but leave them otherwise free

to follow their own pursuits of industry and employment."

The philosopher Herbert Spencer taught that the legitimate functions of government are four in number: one, enforcement of the fulfillment of contract; two, punishment of fraud; three, provision of justice; and, four, protection against foreign invasion.

Our social planners have brought us a long way from that concept of government today. In England, the Fabian Society planned from its beginning in 1883 to bring socialism to the British nation. They succeeded. By deliberate plan, in which the word socialism was never mentioned, the people were sold socialism piecemeal. In our own country, the social planners hotly deny their collectivist intent, yet they have brought us a long way down the socialist road.

Twenty-one per cent of our electric power is generated by public agencies. We have a managed, inconvertible currency; it is illegal for the citizen to have gold. Incentive has been dulled by confiscatory income taxes. Hard work and thrift are no longer enough; the person who would become independent today must search for so-called tax loopholes or acquire "influence" in high places.

Our press has been subjected to censorship by government bureaus. Our Federal Communications Commission rigidly controls much of the spoken word. Just recently, it solemnly proclaimed that only one type of color television will be permitted. Imagine what kind of cars we would be driving today if in 1902 some government bureau had decreed that Henry Ford's planetary transmission would be the only type allowed to develop.

Perhaps most serious of all, a system of so-called progressive education has gained acceptance in many of our schools which, in utter disregard for Nature's laws, exalts group action, abhors competition and discourages individual responsibility. Is it any wonder that after twelve years of indoctrination under such a system, youngsters, although they may never have been taught socialism as such, are ready to embrace the socialist doctrine of "from each according to his ability, unto each according to his need"?

The time is late for a return to the basic principles upon which this nation was founded and grew to greatness. But it's not too late—and as long as it is not too late, doctors belong in politics.

Doctors belong in politics because our own problem is only part of a bigger, far more important, general problem. We must take an ever-active interest in politics, not as doctors, but as informed citizens.

Fortunately, most of us Americans have not lost our instinctive feeling for freedom; our deep-rooted belief that we count for something as individuals, not just as members of our union, lodge or medical society. Our children are not yet ready to join Hitler-type youth movements.

Most of us, I believe, are gradually waking up to the realization that we have strayed from the right path, and must find our way back to it. The first step in finding our way is for all of us—doctors, farmers, plumbers, lawyers, electricians—good citizens all—to concern ourselves with politics.

It was never more important. Our future, our children's future, the fate of our country depends on it.

1401 South Hope Street.

## Mechanism of Syncope and Action of Drugs in Complete Heart Block

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### SUMMARY

*The syncopal attacks of complete heart block may be due either to ventricular standstill or to ventricular acceleration including fibrillation. As treatment may be harmful unless the underlying mechanism in each case is determined, it is important to apply the available methods for differentiation.*

*Epinephrine and certain related compounds (sympathomimetic amines) are the only effective substances in the therapy of ventricular arrest.*

*Isopropyl nor-epinephrine is a most potent drug in the prevention and treatment of ventricular arrest and has the advantage that it does not dispose to fibrillation.*

*Quinidine is unreliable and probably hazardous in the control of ventricular fibrillation in heart block as it appears to precipitate this arrhythmia.*

*Preliminary observations indicate that ectopic ventricular rhythms are also induced by procaine amide in complete heart block.*

*Isuprel® may be of value in the therapy of ventricular acceleration, by preventing the ventricular arrest which frequently follows the initial acceleration.*

THE chief therapeutic problem in complete heart block is the prevention of syncopal attacks. The syndrome of syncope with slow pulse was described in 1827 by Robert Adams<sup>1</sup> of Dublin; the patient, whose pulse rate was 30 per minute, had dyspnea, cough and attacks of fainting. In the same year William Burnett<sup>2</sup> reported a similar case and called attention to the fact that Morgagni had described two patients with epilepsy and slow pulse in 1761. However, general attention was not attracted to this condition until William Stokes<sup>23</sup> published four cases in 1846. Since that time, syncopal attacks associated with heart block have been known as the Adams-Stokes syndrome. For many years, it was generally accepted that the mechanism underlying the Adams-Stokes syndrome was asystole of the ven-

tricles. The cardiac arrest might occur (a) during the transition from normal rhythm to complete block or (b) in the midst of complete block. The Adams-Stokes seizures have been defined as attacks which "occur in patients with auriculoventricular block, when the ventricular diastole is sufficiently prolonged to result in a severe grade of cerebral ischemia."<sup>17</sup>

In 1941 Parkinson, Papp and Evans,<sup>18</sup> in an excellent analysis of 64 cases in which electrocardiograms were made during syncopal attacks of heart block, emphasized that ventricular asystole was not the only mechanism. Of the 64 patients, 18 had ventricular tachycardia and fibrillation followed by ventricular standstill, 13 had ventricular tachycardia and fibrillation without standstill and 33 had ventricular standstill alone. These observers defined the Adams-Stokes attack as "that condition which is seen in patients with complete heart block who suffer from recurrent attacks of loss of consciousness due to ventricular standstill, ventricular tachycardia, ventricular fibrillation or a combination of these." Although the report of Parkinson and his associates emphasized the frequency of ventricular acceleration as the basis of the Adams-Stokes attack, earlier observers<sup>3, 4, 5, 6, 8, 9</sup> had reported this mechanism in heart block. Schwartz and co-workers<sup>19, 20, 21</sup> in 1932 and in a series of later papers carried out a most detailed analysis of graphic records before, during, and after a seizure.

It is apparent that rational therapy directed at the prevention of the Adams-Stokes attack necessitates a recognition of the underlying cardiac mechanism. An electrocardiogram taken during a seizure will (Figures 1 and 3a) demonstrate the mechanism clearly. Since it is not always possible to obtain a record during an attack, other methods may be required and certain observations will lead to suspicion of ventricular acceleration or fibrillation. In ventricular asystole, the transition from the basic rhythm to the cessation of cardiac activity is usually abrupt (Figure 1). However, when the mechanism is ventricular fibrillation, it has been observed by Schwartz and co-workers<sup>19, 20, 21</sup> that, preceding the seizures, there is consistently a regular or irregular acceleration of the heart. Recently Schwartz and co-workers<sup>21</sup> stated that "transient ventricular fibrillation in man has never been observed to be ushered in abruptly without such premonitory signs." These premonitory disturbances of rhythm may be suspected in several ways. First, the patient himself may be aware of an increase in heart rate preceding a syncopal attack. Second, when attacks

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\*Dr. Nathanson died April 24, 1952.

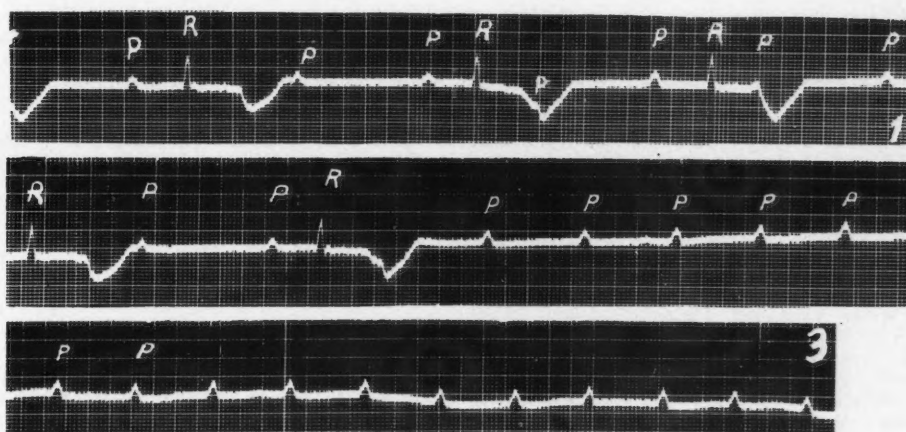


Figure 1.—Upper strip shows complete heart block, ventricular rate 23 beats per minute. Second strip shows the onset of ventricular standstill. After the first two ventricular complexes, the record shows only auricular waves. The lower strip is a continuation of the record.

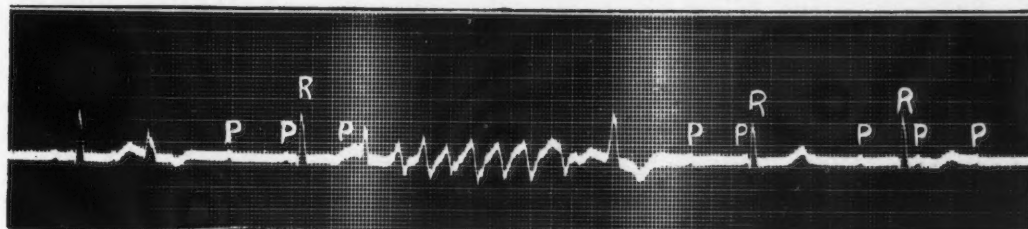


Figure 2.—Complete heart block, showing the basic rhythm interrupted by a series of ventricular oscillations.

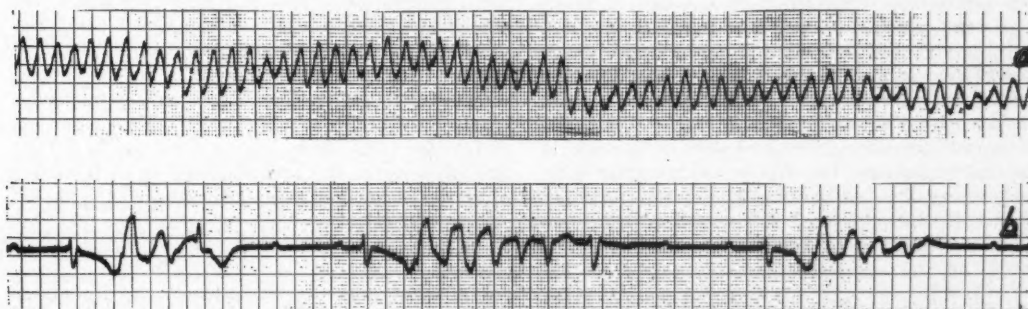


Figure 3.—Strip A, taken during a syncopal attack, shows ventricular fibrillation. Strip B, taken between attacks, shows complete heart block and the basic pattern alternating with short runs of aberrant ventricular oscillations.

are frequent, an observant nurse may note acceleration before the pulse disappears completely and syncope occurs. Third, a physician, on auscultation of the heart between attacks, may hear frequent interruptions of the slow basic rhythm by short runs of rapid and weak beats, most of which cannot be felt at the wrist. The audibility of these contractions becomes progressively weaker after the basic ventricular beat. During these arrhythmic periods, pallor of the face may be noted and the patient may complain of a weak or sinking sensation. Fourth, it is frequently possible in a routine electrocardiogram, es-

pecially if long strips are taken, to observe the basic pattern interrupted by recurrent runs of ventricular oscillations (Figures 2 and 3b). A fifth point which strongly suggests ventricular acceleration and fibrillation as the mechanism is the ineffectiveness of epinephrine and related compounds, which actually may prolong and increase the frequency of attacks.

Certain of these features are illustrated in the case of a patient with heart block observed in 1933. Ventricular fibrillation was suspected although an electrocardiogram was not obtained during an attack.

## CASE REPORT

The patient was a 76-year-old obese, dyspneic woman who complained of fainting spells. Syncopal attacks started on December 22. She had two attacks on that day and on the following. On December 23 an attack observed by a physician consisted of jerking of the extremities and a short period of unconsciousness during which the pulse was absent. Upon examination, the blood pressure was noted to be 230 mm. of mercury systolic and 60 mm. diastolic. The pulse was irregular and the rate 40 beats per minute. Some pulmonary congestion was present. An electrocardiogram indicated complete heart block. During the examination, the patient suddenly gasped for breath, the eyes became fixed and she became unconscious. The pulse and heart sounds were absent. After the attack, when the patient was conscious, the pulse rate was 48 and there were coupled beats. Periodically, on auscultation of the heart, this rhythm was interrupted by a series of rapid, weak beats, which could not be palpated at the wrist. The patient continued to have three or four attacks, lasting up to four or five minutes, a day. Barium chloride given orally had no influence on the attacks, and they persisted after the subcutaneous administration of epinephrine although the pulse rate rose to 56 per minute. Upon inspection of the routine electrocardiogram, occasional series of aberrant ventricular oscillations (Figure 2) were noted. A diagnosis of complete heart block with syncope due to ventricular fibrillation was made. Quinidine sulfate was given orally in doses of 300 mg. three times a day. The patient continued to have from one to three attacks of syncope a day. The pulse rate was usually 40, but immediately after one mild attack an irregular pulse with a rate of 54 beats a minute was noted. On the seventh day of hospitalization the patient died after prolonged syncope.

In that case several features suggested ventricular fibrillation as the mechanism of the syncopal attacks. On auscultation of the heart, the normal rhythm was periodically interrupted by a series of rapid, weak beats which could not be palpated at the wrist. A relatively rapid irregular rate was noted immediately after one of the seizures—a phenomenon described by Schwartz and co-workers.<sup>19, 20, 21</sup> There was a continuance of the attacks after the administration of epinephrine despite a definite increase in the ventricular rate. The presence of irregular aberrant ventricular oscillations in the electrocardiogram could be considered as almost conclusive evidence that longer periods of this rhythm were present during the syncopal seizures.

In the following case, the attacks were so frequent that it was possible to make many records during the seizures. In all of them ventricular fibrillation was noted. Even without those tracings, however, the diagnosis would have been strongly suspected because of the presence of short runs of ventricular oscillations in the electrocardiograms made between the attacks.

## CASE REPORT

The patient, a 78-year-old woman, entered the hospital with a history of repeated syncopal attacks for one month. The blood pressure was 220 mm. of mercury systolic and 70 mm. diastolic. The heart was moderately enlarged and the pulse rate was 40 per minute. In an electrocardiogram, complete heart block was noted. During a period of five days the patient had approximately 200 syncopal attacks,

TABLE 1.—Effect of Pressure on the Carotid Sinus on the Auricular and the Ventricular Rate in Complete Heart Block

Auricular Rate	Ventricular Rate	After Pressure on the Carotid Sinus	
		Auricular Rate	Ventricular Rate
80	38	32	38
88	30	45	30
118	25	84	25
100	34	76	34
64	33	33	33
65	29	44	29

varying from 15 seconds to several minutes in duration. Electrocardiograms made during the attacks showed ventricular fibrillation (Figure 3a). In parts of many tracings made between seizures, complete heart block with a basic ventricular pacemaker from a single focus, was noted. In many portions, this pattern was interrupted by short runs of aberrant ventricular oscillations (Figure 3b).

As was mentioned previously, ventricular activity of the kind noted in this case may be considered a prefibrillation mechanism and it indicates that ventricular fibrillation is the basis for the syncope.

## INFLUENCE OF THE VAGUS NERVE IN COMPLETE HEART BLOCK

Increased activity of the vagus nerve has been considered a possible basis for the critical slowing of the ventricular rate or for the asystole of heart block. If this were the case, the administration of atropine could prevent the inhibition of the ventricles. However, this drug has not been found to be effective in the prevention of syncopal attacks. This is probably due to the fact that there is little or no vagal innervation to the ventricular pacemaker. The absence of a vagal effect on the ventricular pacemaker is indicated by the observation in which carotid sinus pressure was applied in six patients with complete heart block. The effect of this reflex vagus stimulation was observed on the auricular and ventricular rates. There was a reduction of 50 per cent or more in the auricular rate in each patient while the ventricular rate was unaffected (Table 1).

## ACTION OF DRUGS THAT STIMULATE THE RHYTHMIC FUNCTION OF THE VENTRICLES

The observations of Danelopolu and Danulescu (1915) on the beneficial action of epinephrine in heart block have been confirmed in many subsequent reports. However, favorable effects have been ascribed from time to time to other unrelated compounds such as nikethamide (Coramine<sup>®</sup>), Metrazol,<sup>22</sup> desiccated thyroid and barium chloride. The ventricular standstill in heart block is due to a temporary failure of ventricular automaticity so that no pacemaker is functioning. The effectiveness of a drug in the therapy and prevention of ventricular standstill depends on its ability to increase the rhythmicity or pacemaking property of the ventricles. In previous studies<sup>14, 15</sup> it was concluded that epinephrine and related compounds, sympathomimetic amines, are the only substances which stimulate

this property of the heart. Of a group of these substances studied, epinephrine was the most active in the prevention of cardiac standstill. Two other compounds, ephedrine and Paredrine,<sup>9</sup> were of interest because they are effective on oral administration. The oral route is desirable in patients with complete heart block with infrequent syncopal attacks, where self-medication for the prevention of attacks is indicated. Paredrine was found to be more active than ephedrine. In six patients with heart block, 100 to 150 mg. of ephedrine sulfate was required to increase the ventricular rate. A similar increase in rate was obtained by giving 60 to 80 mg. of paredrine hydrobromide.

Recently a new epinephrine-like compound, isopropyl nor-epinephrine (Isuprel<sup>®</sup>) was introduced for the treatment of bronchial asthma.<sup>10</sup> This drug differs chemically from epinephrine in that an isopropyl group on the terminal nitrogen of the side-chain replaces the methyl group of epinephrine. The chief difference in its action is that the pressor effect of other sympathomimetic drugs is either absent or minimal. In a previous study it was noted that Isuprel was very potent in the prevention of cardiac standstill which can be induced in man by pressure on the carotid sinus.<sup>16</sup>

The effect of this drug in heart block was studied by three routes of administration—intravenous, subcutaneous and sublingual.

*Intravenous administration.* Isuprel 0.02 mg. was injected intravenously in eight patients with heart block and the effects compared with the reactions following the intravenous administration of 0.03 mg. of epinephrine. The procedure was as follows: a control electrocardiogram was made and three blood pressure readings recorded. The drug was then injected and a continuous electrocardiogram made. The blood pressure was recorded 30 seconds after the injection and thereafter at one-minute intervals.

After both drugs, the ventricular rate rose promptly and remained elevated for from seven to fifteen minutes. Following the intravenous dose of 0.03 mg. of epinephrine, the average increase in ventricular rate was 30 beats per minute. The minimum increase was 20 and the maximum 47 beats per minute. Following the injection of 0.02 mg. of Isuprel the average increase in ventricular rate was 22 beats per minute. The range of increase was from 10 to 39 beats per minute. Considering the smaller dose of Isuprel used, the response of the ventricular rate was approximately the same following both drugs. Following the administration of epinephrine, there was a sharp and pronounced rise in the systolic pressure. The diastolic pressure increased a little. After the injection of Isuprel, the systolic pressure rose slightly to moderately in two patients and was unchanged or depressed in six patients. The diastolic pressure was depressed in six and unchanged in two patients.

*Subcutaneous administration.* The response of the ventricular rate to a subcutaneous injection of epinephrine and of Isuprel was studied in three patients with complete heart block. The dose of epinephrine used was 1 mg., and of Isuprel 0.2 mg. A

control electrocardiogram was made and the drug injected. Electrocardiograms then were made at five-minute intervals for fifteen minutes and thereafter every fifteen minutes for from one to two hours. The ventricular rate was increased by both drugs. In each instance the rise in rate following Isuprel was greater than that after epinephrine was given.

*Sublingual administration.* Following sublingual application of Isuprel in the treatment of bronchial asthma, the patient is frequently conscious of an increase in heart rate, which indicates that there is sufficient absorption of the drug to influence the sinus rate. The drug was administered by this route in four patients with heart block, and electrocardiograms then were made at five-minute intervals for from one to two hours. The dose for each patient was 15 mg. on one trial and 30 mg. on another occasion. The response to both doses was a sustained rise in ventricular rate. The increase in rate varied considerably and was from 3 to 47 beats per minute. The onset of the effect varied from fifteen to thirty minutes after the application of the drug and the duration was from 45 minutes to two hours.

#### ACTION OF DRUGS ON VENTRICULAR ACCELERATION AND FIBRILLATION

It would seem that the drugs indicated for the prevention and treatment of ventricular acceleration and fibrillation would be the cardiac depressant or antifibrillatory drugs. Quinidine has been used for this purpose in heart block and the reports are conflicting. De Boer<sup>3</sup> reported that quinidine was ineffective in the prevention of ectopic ventricular rhythms in heart block, and that the drug actually induced these rhythms, including ventricular fibrillation. His explanation was that quinidine produced variations in the refractory period irregularly in different parts of the heart, permitting the development of a circulatory wave from reentrant beats. Kerr and Bender<sup>9</sup> described a case of complete heart block in which attacks of ventricular fibrillation occurred during the course of quinidine therapy. Dock,<sup>5</sup> however, concluded that maintenance doses of quinidine prevented attacks of paroxysmal ventricular fibrillation. Escamilla,<sup>6</sup> after prolonged observation of a patient with attacks of paroxysmal ventricular fibrillation, concluded that quinidine seemed to be of some value but that the effect was not sufficiently constant to permit any absolute conclusions as to its efficacy. Schwartz and Jezer<sup>22</sup> made a careful study of two patients with complete heart block who were subject to transient seizures of ventricular fibrillation. Quinine hydrochloride and quinidine were administered intravenously in graded doses. Both drugs, quinine (maximum dose: 0.10 gm.) and quinidine (maximum dose 0.02 gm.) consistently induced either a prefibrillatory mechanism or transient periods of ventricular fibrillation. It is to be noted that the patient in Case 1, reported herein, died in syncope while receiving quinidine therapy. These observations indicate that the administration of quinidine may be hazardous in patients

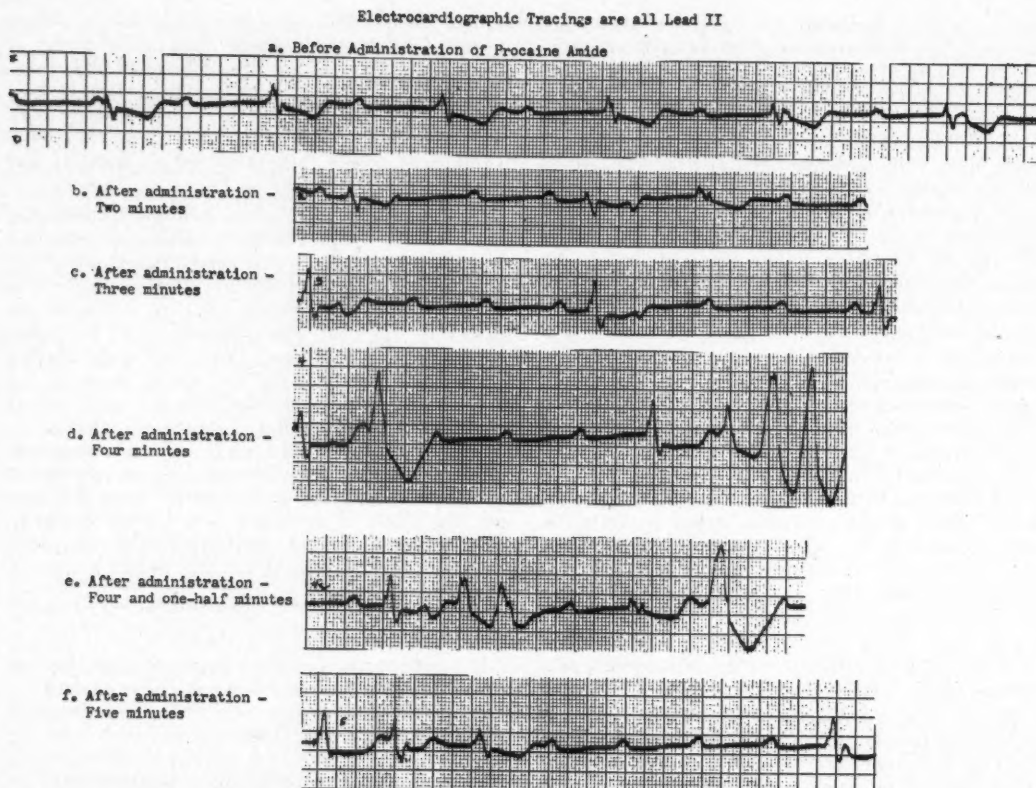


Figure 4.—Strip A shows complete heart block, ventricular rate, 34 per minute. Strips B and C, taken 2 and 3 minutes after the start of an intravenous injection of procaine amide, show a reduction of the ventricular rate to 25 and 20 beats per minute. Strips D, E and F, taken 4, 4½ and 5 minutes after the start of the injection, show most of the basic ventricular complexes replaced by multifocal ectopic ventricular beats.

with complete heart block in whom syncopal attacks are due to ventricular fibrillation.

Recently Mark and co-workers<sup>12</sup> reported the suppression of ventricular premature contractions and the termination of attacks of ventricular tachycardia by the administration of procaine amide (Pronestyl®). In a study of a group of 55 patients, Miller, Nathanson and Griffith<sup>13</sup> noted that this drug abolished ectopic ventricular beats and rhythms with great consistency. It seemed of interest to study the action of this drug in complete heart block. The drug was administered intravenously in four patients. The dose was 500 mg. in one patient, 300 mg. in another and 200 mg. in two patients. In each patient, there was a definite reduction in the ventricular rate. In two patients, the injection of procaine amide was followed by the appearance of ectopic ventricular beats from multiple foci occurring in runs, resembling the prefibrillatory mechanism described by Schwartz and Jezer (Figure 4). In the fourth patient, transient ventricular fibrillation followed the intravenous injection of 200 mg. of procaine amide. In the patient described earlier, in whom ventricular fibrillation was demonstrated as the mechanism of the syncopal attacks, procaine amide administered intravenously and orally had no influence on the fre-

quency or duration of the attacks. These observations indicate that procaine amide, like quinidine, is of no value and is probably contraindicated in the therapy of heart block.

#### DISCUSSION

The importance of recognition of the mechanism causing the syncopal attack in heart block is apparent, since epinephrine and related compounds, indicated in the therapy of ventricular standstill, are contraindicated in ventricular fibrillation, as these drugs can precipitate this serious arrhythmia. The administration of these compounds, when the seizures are due to ventricular fibrillation, may cause transient arrhythmia to become permanent and fatal. The authors have observed that Isuprel is a very potent compound for the prevention and treatment of ventricular standstill. In addition to its potency, this drug possesses a most important advantage over epinephrine in that it does not appear to dispose the ventricles to fibrillation. Garb and Chenoweth<sup>7</sup> consistently produced ventricular fibrillation in cats during hydrocarbon inhalation by the administration of nor-epinephrine and epinephrine. Isuprel did not produce this arrhythmia, in any instance, under the same conditions. The authors' clinical observations tend to confirm the experimen-

tal studies of Garb and Chenoweth. In one case, that of a patient with complete heart block, the administration of epinephrine was followed by multifocal ectopic ventricular beats, and nor-epinephrine induced transient ventricular fibrillation. Isuprel in this patient produced a greater increase in the basic ventricular rate and yet the drug did not stimulate any lower ventricular rhythmic foci. This tendency for Isuprel to limit its action predominantly to the basic ventricular pacemaker has been quite consistent in the authors' studies. In contrast nor-epinephrine had no effect on the normal ventricular pacemaker and frequently induced multifocal ventricular beats, resembling a prefibrillatory mechanism. Epinephrine, while stimulating the basic pacemaker, also frequently excited lower ventricular foci.

The method of administration of Isuprel in the therapy of cardiac standstill depends upon the urgency of the situation. In the presence of syncope due to cardiac arrest, it may be advisable to administer the drug by intracardiac injection. An effective dose by this route is 0.02 mg. If the ventricular rate is at a critically low level, the drug may be injected intravenously in the same dose. These routes of administration are seldom necessary and the usual mode of application of the drug is by subcutaneous injection. A dose of from 0.14 to 0.2 mg. is usually sufficient to increase the rate of the ventricles. When syncope attacks are infrequent and self-medication over a long period is desirable, Isuprel may be administered by the sublingual route. A dose of 15 mg. three or four times a day appears to be an effective amount.

It is apparent that there is no safe and effective drug for the prevention of paroxysms of ventricular acceleration or fibrillation in heart block. The reports in the literature indicate that quinidine has either no effect or an unfavorable one. As was noted in the present study, intravenous administration of procaine amide induces ectopic ventricular rhythms in heart block. It is of interest that such a response was not observed when this drug was given to patients who had arrhythmia of other kinds. Although the studies were limited, the results suggested that procaine amide may have undesirable effects in heart block. When the mechanism of the syncope is unknown, Isuprel possesses optimum features in its action, in that it will be effective when the mechanism is ventricular standstill and will exert no unfavorable effect when it is ventricular fibrillation. It would appear that Isuprel may be indicated when the mechanism is known to be ventricular acceleration. Parkinson, Papp and Evans<sup>18</sup> noted that, in a large proportion of patients in whom ventricular acceleration and fibrillation developed, the initial mechanism was followed by a ventricular standstill. Isuprel, by preventing the ventricular arrest, could shorten the duration of syncope. Levine and Matton<sup>11</sup> reported a case of Adams-Stokes syndrome in which, after ventricular fibrillation and asystole lasting five minutes, the patient recovered upon injection of epinephrine into the heart.

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## Avoiding Pitfalls in Urologic Diagnosis

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### SUMMARY

*Eight basic steps properly executed are necessary to correct diagnosis of urinary disorders: (1) History-taking, (2) general physical examination, (3) abdominal examination, (4) examination of external genitalia, (5) examination of the urine, (6) rectal examination and prostatic smear or vaginal examination, (7) tests of total renal function, (8) roentgenography as indicated.*

*If these procedures are carried out in this order, more information will be obtained and misleading findings will be avoided.*

If it were possible to analyze all diagnostic failures in urology, it would probably be found that an overwhelming majority are attributable to lack of adequate examination. "Adequate examination" does not refer to the technical steps such as cystoscopy and ureteral catheterization, but means taking full advantage of the simple steps of the urological examination (Table 1) which can be carried out by any general practitioner in his own office.

When eight basic steps are executed properly, an accurate diagnosis can be reached in over 90 per cent of cases in which patients consult a physician because of symptoms referable to disease of the urogenital tract. By adhering to this specific routine the physician will avoid omitting any of the vital steps and also avoid committing errors that arise when they are carried out in an improper sequence.

**Step 1, the History:** Nothing unusual is required in taking the history except that particular stress is placed on complaints referable to the urogenital tract. A physician should not be misled by a report of chills. Chilly sensations are common, almost universal; actual chills are unusual. An authentic shivering chill is of diagnostic importance if it is caused by urinary infection, because then it usually indicates an acute renal infection, sometimes acute prostatitis, but almost never cystitis.

**Step 2, General Physical Examination:** This includes examination of the head, neck, chest and the nervous system and precedes special attention to the urogenital organs. This part of the examination assumes greater importance if a patient is to be operated upon, when the condition of the cardiovascular system is a material factor, and in any effort to discover systemic evidence of tuberculosis, malignant growth and the like. A neurologic examination is especially required when the possibility of a ner-

vous disorder, such as neurogenic bladder disease, is encountered.

**Step 3, the Abdominal Examination,** includes special attention to the regions occupied by the kidneys, the ureters and the bladder.

One word of caution about renal palpation: Failure to elicit signs of tenderness does not rule out the possibility of infection in the kidney. Chronic renal infection often causes no physical symptoms, and even acute infections may produce no pain or tenderness, particularly in children. Even with a temperature of 104° or 105° F. caused by fulminating pyelonephritis, children frequently have no lumbar pain and no tenderness upon palpation. The most reliable means of detecting minimal tenderness is percussion with the fist posterior to the kidney, but even this may not be successful.

**Step 4, Examination of the External Genitalia:** Here lie many pitfalls for the inexperienced ob-

TABLE 1.—The Routine Non-Instrumental Steps of a Urologic Examination.

1. **History:** (a) Urinary, (b) Sexual, (c) Other systems.
2. **General physical examination apart from urogenital tract:** Temperature, pulse, respiration, blood pressure. (a) Head, (b) Neck, (c) Chest, (d) Nervous system.
3. **Abdominal Examination:** Particular care in examining the regions occupied by kidneys, ureters and bladder, including fist percussion of the renal areas posteriorly.
4. **Examination of external genitalia: Making a urethral smear when a discharge is present.** This step is carried out prior to collecting the urine because it is impossible to be certain of the presence of a urethral discharge or to obtain a smear after the patient has voided.
5. **Examination of the urine:** Male, three-glass test; female, catheterized specimen. Three-glass test roughly differentiates lower from upper tract disease in the male. Microscopic elements found in the voided urine may come from extraneous sources in the female.
 

(a) Specific gravity	(d) pH
(b) Protein	(e) Microscopic examination
(c) Sugar	(f) Stain of urinary sediment.
6. **Rectal examination and prostatic smear in the male; vaginal and rectal examination in the female:** In the male the patient voids prior to examination of the prostate; otherwise the prostatic secretion will contain pus from the urethra if urethritis is present, rendering it impossible to localize its source.
 

(a) Examination of anus and sphincter
(b) Palpation of prostate and seminal vesicles
(c) Gentle massage of prostate and stripping of seminal vesicles unless contraindicated, as in the presence of acute infection.

In the female the urine is withdrawn with a catheter prior to pelvic examination in order that this examination may be made with bladder empty.
7. **Total renal function:**

(a) Tests of excretion (PSP)
(b) Tests of retention (blood urea, nonprotein nitrogen, creatinine).
8. **Roentgenography (as indicated):** Plain x-ray of kidneys, ureters and bladder, intravenous urograms, x-rays for evidence of metastasis.

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server. The physician should ascertain whether there is or has been a urethral discharge. This must be done before examination of the urine (Step 5), because if the patient urinates just before examination of the external genitalia any urethral discharge will be washed out by the urine.

Dependence must not be placed upon a patient's statement that he has had no discharge. In females, vaginal secretions are so common that many consider them natural; males may be either oblivious to a discharge or ashamed to admit its presence. In examining for a urethral discharge it is advisable to strip the urethra. This one simple maneuver will often provide the clue to the source of obscure pyuria. In the female, pressure over the urethra may disclose an unsuspected diverticulum when a gush of pus is expressed into the external urethral orifice.

Two misconceptions to be avoided concern the significance and character of a urethral discharge: First, that every urethral discharge is gonococcal, and second, that a precise diagnosis can be made by gross inspection of the discharge—that the infection is gonococcal if the discharge is thick and creamy but nonspecific if it is thin and watery. In many cases of acute nonspecific urethritis the discharge is purulent, while a gonococcal discharge may be detectable only as a thin serous ooze, sometimes characteristic in repeated attacks.

In order to make an accurate distinction, a stained smear of the discharge must be prepared and the organisms present identified under a microscope. This simple procedure can be carried out by a physician in only a few minutes (Table 2). The advantage to a physician in making the smear himself is that he can determine at once whether and what treatment is required; also how many organisms and pus cells are present and whether the diagnosis is clearly evident or merely suspicious—information sometimes difficult to obtain second-hand.

In examination of the external genitalia it must be ascertained whether the external urethral orifice is of normal size. Unrecognized congenital atresia of the orifice may lead to severe obstruction and even to bilateral hydronephrosis and profound uremia (Figure 1).

Lest an obscure testicular neoplasm be overlooked meticulous care must be taken in palpating the testis. A testicular tumor may be little larger than the eraser on a lead pencil. Since the majority of tumors of the testis are malignant, it is extremely important to detect them as early as possible. Tumors of the epididymis, on the other hand, are extremely rare and almost always benign.

A fairly common error is failure to recognize torsion of the spermatic cord, a condition which demands immediate operation. Torsion is frequently misdiagnosed as acute epididymitis, and before the error is recognized the testicle is beyond salvage. Although the two conditions are similar in that they are both exquisitely painful, certain features differentiate them; but if there is any doubt, the safer course is surgical exploration of the scrotum.

TABLE 2.—Simple Methods for Useful Office Procedures

1. Examination of the urine:

- (a) *The three-glass test in the male:* Instruct patient to void without interruption into three glasses. First glass contains washings from urethra; second and third, urine from bladder; third glass may contain pus or blood introduced by piston-stroke action of vesical neck closure, as in acute posterior urethritis.
- (b) *Determination of the pH:* Nitrazene paper.
- (c) *Protein tests (albumin):* Add a few drops of sulfo-salicylic acid (20 per cent).
- (d) *Sugar:* Add a Clini-test tablet.
- (e) *Examination of sediment:*
  1. Centrifuge adequately.
  2. Invert centrifuge tube to allow all but a few drops to drain out.
  3. Make thin smear of sediment on clean slide; examine under microscope (low and high dry fields).
  4. Dry over low flame to fix (do not burn.)
  5. Stain.
    - a. Loeffler's methylene blue—most rapid stain for common pyogenic bacteria, excellent for showing morphologic features—best general purpose office stain.
    - b. Gram stain—best for identification of gonococci.
  6. Examine under oil immersion lens.
- (f) *Determining cause of cloudy urine:*
  1. Phosphates—clear on acidification (add few drops glacial acetic acid).
  2. Carbonates—clear on acidification, with formation of bubbles.
  3. Urates—white or pink cloud (brick dust deposit), clear on heating.
  4. Chyluria—clears upon shaking with ether.
  5. Pus—determined by microscopic examination, does not clear on acidification or heating.
  6. Bacteria—determined by microscopic examination, do not clear on acidification or heating.
  7. Red blood cells—determined by microscopic examination, do not clear on acidification or heating.
  8. Spermatozoa—determined by microscopic examination, do not clear on acidification or heating.
  9. Prostatic fluid—determined by microscopic examination, does not clear on acidification or heating.

2. Urethral Smear:

Examine wet for trichomonas (add 1 per cent safranin for better identification). Heat over low flame to dry and fix—do not burn. Stain with methylene blue or Gram stain. Examine with oil immersion lens.

3. Prostatic Smear:

Collect specimen, after massage, on clean glass slide; occasionally stripping of urethra or having patient void a few drops of urine is necessary to obtain secretion. Examine under low power, noting presence of pus (leukocytes numbering less than 5 per cent of all cellular elements are of no clinical significance), trichomonas, lecithin bodies, corpora amylacea, etc. Stain to determine presence of bacteria.

4. Tests of renal function:

- (a) *Specific gravity of urine:*  
A specific gravity of 1.025 or higher, if no protein is present, indicates normal renal function.
- (b) *PSP (simple modification as office procedure):*
  1. Have patient drink 2 glasses of water.
  2. Inject 1 ml. of dye intravenously.
  3. Collect urine 20 minutes after injection.
  4. Place entire specimen in 1,000 ml. graduate, add a few ml. of 10 per cent sodium hydroxide to color red and dilute to 1,000 ml. with tap water.
  5. Determine percentage of PSP excretion with colorimeter—normally 25 to 50 per cent is excreted in 15 minutes. In this 20-minute test 5 minutes is allowed for appearance time.



Figure 1.—Bilateral hydronephrosis and hydroureter in a boy 11 years of age with profound uremia from congenital atresia of external urethral orifice. Note trabeculation of the bladder. (Courtesy of Dr. George L. Torassa.)

*Step 5, Examination of the Urine*, likewise presents many pitfalls to the unwary. One of the commonest is to conclude that a female patient has pyuria or hematuria merely because the voided specimen contains pus or erythrocytes. The presence of pus cells, erythrocytes or bacteria in the voided urine of a female patient may be of no clinical significance, yet many a patient is referred to a urologist on the basis of these findings alone. The proximity of the urethra to the vagina frequently permits contamination of the urine with the products of vaginal discharge and menstrual flow. Mistake as to the source of contamination may be avoided by taking a specimen of urine by catheter whenever abnormal elements are found. In urologic practice female patients are catheterized routinely to save time, for if, after voided urine is found to contain pus or blood, a catheter is introduced to obtain a proper specimen, there is usually no urine left in the bladder.

Simple examinations of the urine can be conveniently performed by a physician (Table 2). If the urine is sent to a laboratory there is always the chance that examination may be delayed and that, if it is, erythrocytes may disintegrate in acid urine and extraneous bacteria may be introduced and multiply. Furthermore, here as with examination of the urethral discharge, immediate examination provides a guide for immediate treatment.

By the simple means of the three-glass test of the urine of a male patient it is possible roughly to distinguish disease of the lower urinary tract from disease of the upper tract. For instance, if pus cells are contained in only the first glass of the voided urine, it is certain that infection is confined to the

lower urinary tract and that there is no infection of the kidneys—unless there is blockage of a ureter. Another way in which the three-glass test may prove valuable is in localizing the source of hematuria in male patients. If, for example, the blood is equally distributed in all the urine voided, it probably comes from the bladder or the upper urinary tract. If, on the other hand, the first and second glasses are relatively clear and there is a great deal of blood in the third glass, it is practically certain that the lesion is at the neck of the bladder and that the blood is forced into the urine by the piston-stroke action of vesical closure.

Gross examination of the urine is inadequate, but often nothing more is attempted. If a specimen appears to contain blood, for example, there is a strong temptation not to bother to examine it under a microscope. Yet if this is not done, hemoglobinuria cannot be recognized, nor can it be known whether the blood is accompanied by pus cells and bacteria indicating that bleeding may be caused by infection in the urinary tract.

Often a person seeks medical advice because of cloudy urine. Cloudiness of the urine does not mean that it contains pus, yet the misconception that it does is common among patients, if not among physicians. Whether it does or does not can be determined readily by examining the sediment under the microscope. Likewise, foul smelling urine is not always indicative of disease; frequently fetor results from the ingestion of asparagus or from some other benign cause.

An error that causes failure to recognize chronic pyelonephritis is the belief that if there are no pus cells in the urine there is no urinary infection. In many cases of chronic nonspecific pyelonephritis, the urine contains bacteria but no pus cells or erythrocytes. For this reason it is necessary to examine not only a wet smear of the urinary sediment, but also a stained specimen. Usually, motile bacilli can be seen in the wet preparation, but it is impossible to detect cocci without a stain. Other conditions in which bacteria often are present in the urine without pus or erythrocytes are perinephritis, perinephric abscess and the early stages of coccal nephritis.

If pus cells are present in the urine, and bacteria are not, usually the source is nonspecific prostatitis or urethritis. The reason for the absence of observable bacteria in most such cases is not always clear. Some infections are caused by organisms like those of pleuropneumonia, which are detectable only by special cultural methods. To be considered also is that, if a patient has been receiving antibiotics, bacteria frequently have been eliminated by the action of the drug. In other instances, an apparently amicrobial infection may be tuberculous; tubercle bacilli are difficult to detect in the urine by ordinary means of examination.

Another common misconception is that if the urine is normal there is no lesion of the urinary tract. This leads to error in the case of female patients with frequency of urination, dysuria, suprapubic pain and nocturia. Often if the urine contains no pus or

erythrocytes or organisms, the underlying condition is thought to be functional, although these symptoms of vesical irritability may be caused, without any abnormality in the urine, by any of five conditions: (1) submucous fibrosis, (2) trigonitis, (3) contracture of the vesical neck, (4) neurogenic disorder of the bladder, and (5) stricture of the urethra. Cystourethroscopic examination is necessary.

*Step 6, Rectal Examination and Examination of Prostatic Secretion.* Perhaps the most important word of caution is to urge that rectal examination never be omitted. Even after Osler's sage advice that nine-tenths of all rectal lesions lie within one finger's-length of the anus, some physicians omit this essential step or, if they do make the examination, fail to interpret the findings accurately.

Dr. Egon Wildbolz of Berne, Switzerland, once spoke in San Francisco on the early diagnosis of carcinoma of the prostate. When he had completed his talk a medical student asked, "Doctor, can you tell me just how one makes the diagnosis of carcinoma of the prostate by rectal examination?" Al-

though Dr. Wildbolz had devoted at least thirty minutes to discussion of that procedure, he did not hesitate to reply. "Yes," he said, "I can tell you. If you perform 2,000 rectal examinations you will have absolutely no difficulty in making early diagnosis of carcinoma of the prostate."

It is an inviolate rule that prostatic massage must never be performed if there is acute infection in the urethra or in any part of the seminal tract, because of the danger of increasing and spreading the infection. In all other cases, examination and massage of the prostate gland must follow, not precede, collection of the urine—this in order that the cellular elements of the urine and the prostatic secretion will not be mixed. It is probably reversal of the order of these procedures which gives rise to the misconception that chronic prostatitis is a common disease. If a patient has mild urethritis, which is a common disease, massage of the prostate gland presses the secretion through the purulent urethra. Consequently, the pus in the secretion is erroneously thought to be due to prostatic infection. If the patient urinates before the prostatic secretion is ex-

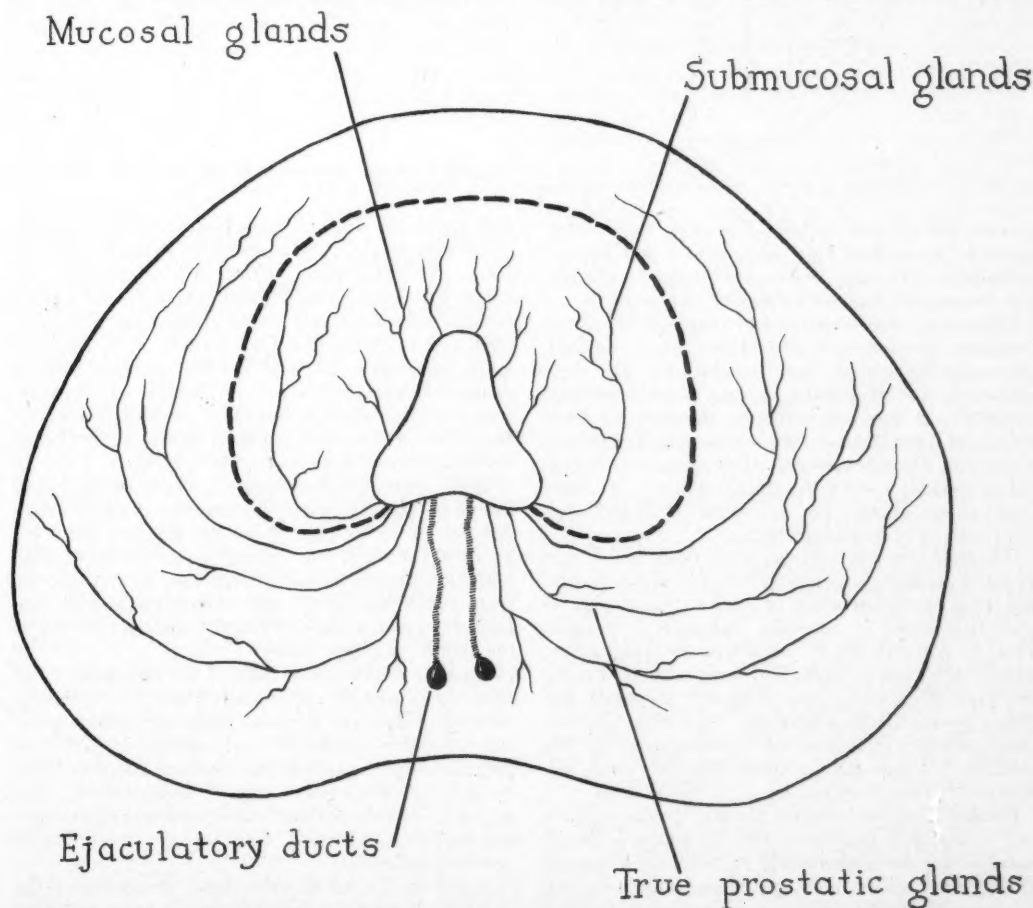


Figure 2.—Cross-section of arrangement of prostatic glands. Pressure must be applied from a lateral direction medially in order to express secretion.

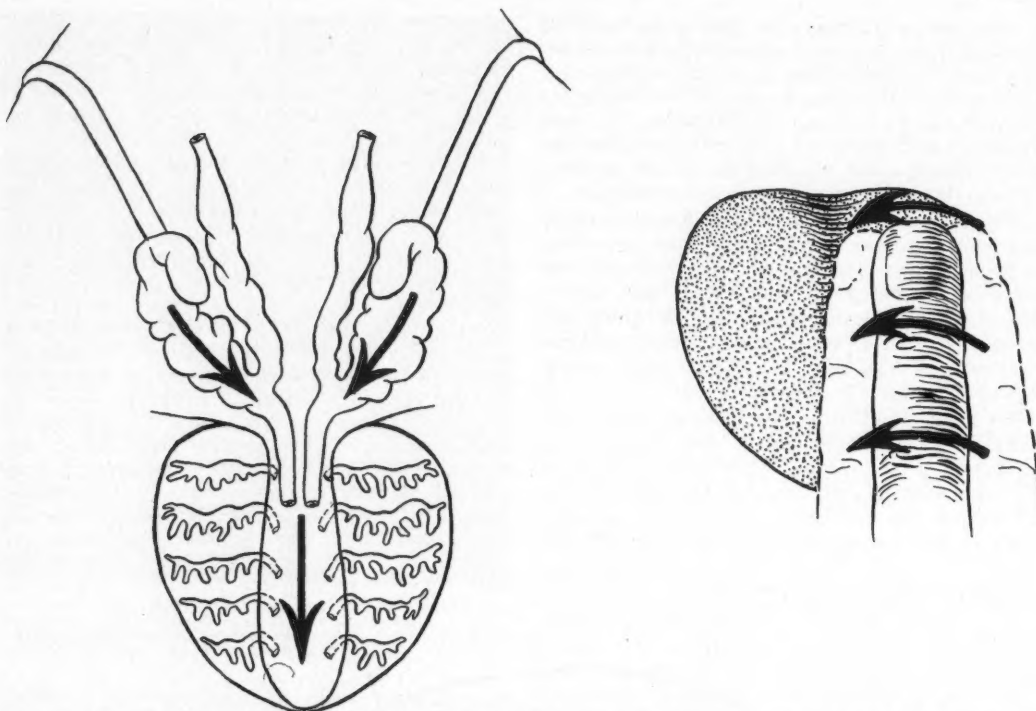


Figure 3.—Method of prostatic massage. Firm but gentle pressure is applied with a rolling motion of flat surface of index finger. Final step is gentle stripping of seminal vesicles and evacuation of prostatic urethra.

pressed, this error is avoided. The presence of a few pus cells in seminal fluid (less than 5 per cent of the cellular elements) that is obtained after the patient has urinated is not indicative of prostatitis.

Massage of the prostate gland is not an innocuous diagnostic procedure. It should be carried out with extreme gentleness and at infrequent intervals; done vigorously and repeatedly, it may cause traumatic prostatitis. It is not necessary to massage the prostate gland three times within a week to make certain that prostatitis is not present. If the gland seems normal on palpation and if the secretion is normal, these observations should be considered sufficient evidence that there is no infection.

O'Connor<sup>1</sup> in experiments with dogs noted that repeated prostatic massage evokes traumatic prostatitis. In a controlled series of animals, the degree of prostatitis noted at necropsy was directly proportional to the number of massages the animals received: After the prostate had been massaged daily for seven days, there were extensive abscesses and diffuse parenchymal prostatitis. Dogs that had had fewer prostatic massages had proportionately less prostatic involvement. In those dogs in which the prostate had not been massaged, it was normal.

Parallel observations were plentiful in the author's early clinical experience when frequent prostatic massage was more commonly resorted to. Vigorous massage often evoked a violent inflammatory reaction in a normal prostate gland or in one with minimal chronic prostatitis. It is the author's present opinion

that treatment of even mild, asymptomatic chronic prostatitis by vigorous or frequent massage is of no benefit, and that patients with such a condition do better with no treatment at all. The fear of focal infection from prostatitis seems to have been exaggerated and the hazard not as serious as it was formerly believed to be. The fact that patients without urogenital complaints are no longer so often referred to urologists in an effort to find foci of infection is indicative that others in the medical profession are coming to share this opinion.

With regard to the rectal examination, it should not be concluded, merely because the prostate seems normal on rectal palpation, that the possibility of an obstruction of the vesical neck has been ruled out. Although the rectal surface may be normal, the vesical neck may be severely obstructed by a median lobe or a median bar or by intravesical projection of the lateral prostatic lobes.

Another pitfall lies in making the erroneous diagnosis of prostatitis on the sole basis of tenderness on rectal palpation. In many cases the normal prostate is tender—so tender, as a matter of fact, that palpation may cause patients with no disease of the prostate to lose consciousness. (It is mystifying that, as a general rule, patients experience more pain during rectal examination than during passage of a urethral catheter.)

A knowledge of the glandular structure of the prostate enables the physician to perform prostatic massage intelligently. Since the ducts drain toward

the urethra (Figure 2) it is important to apply pressure from the side medially. The prostate should not be rubbed. By applying firm but gentle pressure with a rolling motion of the flat surface of the index finger (Figure 3), secretion is obtained without damage to the delicate glandular structure of the organ. As a final step, secretion is evacuated gently by stripping the seminal vesicles and the urethra. The reason so many physicians fail to obtain secretion on prostatic massage is that they do not observe these few simple rules.

The counterpart of the rectal examination of males is the combined rectal and vaginal examination of women. Here a point to remember is that this step must follow, not precede, catheterization of the bladder, for urine retained in the bladder may be mistaken for a pelvic mass, an error which has even led to unnecessary pelvic operations.

*Step 7, Tests of Total Renal Function*, is not necessary if the diagnosis has been established by the previous steps, as for example in cases of uncomplicated urethritis or hydrocele of the tunica vaginalis. If, on the other hand, the symptoms or the previous investigation indicate the possibility of abnormality of the kidneys or ureters, the carrying out of this and the following step is imperative. Study of the upper urinary tract is likewise required if a lesion in the lower urogenital tract involves or affects the upper urinary tract.

There are two groups of tests from which to choose: (1) the tests of retention and (2) of excretion. An accurately performed test from either of these groups is sufficient, but tests from one group may be used to confirm those from the other.

All tests of urinary retention—determination of blood urea, non-protein nitrogen and creatinine—are innocuous. Disadvantages are that they are not office procedures and that obtaining a report is delayed.

Fortunately, two innocuous tests of excretion are simple office procedures and can be carried out within a few moments by a physician or a nurse: (1) Determination of the specific gravity of the urine. If the specific gravity is 1.025 or above and there are no abnormal cellular elements, renal function is normal. (2) The phenolsulfonphthalein (PSP) test. This is especially useful in a busy office practice when three or four new patients all come in at the same time. A nurse can inject 1 ml. of PSP intravenously, or even intramuscularly, and the patient will be content to wait while the test is in progress, knowing time is not being lost until the physician can see him. Collection of urine can be made at intervals of from 20 minutes up to two hours, allowance being made for the time of collection. The PSP test can also be used as an isolated test or a confirmatory test to check renal function of patients whose urine has a low specific gravity or contains cellular elements. Excretion of 25 per cent or more of the dye within 20 minutes after intravenous injection is a rough indication of normal function. If no more than 15 per cent has been excreted within that time, function is probably adequate to permit

excretion of the contrast medium for intravenous urography, but if the percentage drops below this, the risk is too great. To conclude the PSP test a urethral catheter is passed to determine the amount of residual urine. This assures that all the urine has been collected for the PSP reading—as it must be for an accurate determination.

Intravenous urography is another excretory test of renal function, but it is not without hazard, as will be explained. With the use of this method, a roentgenogram made after the patient urinates provides a check on the amount of residual urine.

It should be pointed out that none of the tests of renal function gives indication of renal reserve. When the readings are normal there is no way of distinguishing between patients with a large renal reserve and those who may be on the borderline of renal failure.

*Step 8, Roentgenography*: Like the tests of renal function, this step may be unnecessary if a conclusive diagnosis has been previously established. If roentgenography is decided upon, the tests of renal function are a prerequisite. The radiologist tests the patient for sensitivity to the contrast medium, but it is the responsibility of the physician ordering the study to be certain that the patient has adequate renal function. If the renal function is severely impaired, not only are intravenous urograms a wasted expense to the patient (because the kidney shadows do not appear on them), but there is a very real danger in injecting a contrast medium that will not be promptly excreted. The author has observed one fatality that resulted from this error: The patient, a young man, died of pulmonary edema caused by the retained medium. Evidence of acute glomerulonephritis was found at autopsy. In that case urography had been precipitously ordered when hematuria was observed; no prior examination of the urine or test of renal function was made, although these steps would have established the correct diagnosis and revealed the danger of intravenous urography.

A few cautions should be kept in mind regarding the interpretation of intravenous urograms:

1. The fact that a kidney is not visible during the intravenous study is not certain evidence that the kidney is absent or functionless. It is a danger signal that demands prompt interpretation, usually by cystoscopy, in the hope of salvaging a functioning kidney that is being destroyed by a block of some kind.

2. A normal calyceal and pelvic outline is no indication that the kidney is normal unless the outline is surrounded by a wide rim of renal parenchyma (Figure 4). An infantile or an atrophic kidney may be deceptive in excreting the contrast medium promptly and producing a pelvic shadow which on superficial examination appears normal. In interpretation of a urogram, as much stress must be placed on the appearance of the entire kidney as upon the internal anatomy of pelvic structures.

3. A grossly normal appearance on an intravenous urogram cannot be assumed to rule out the possibility of early renal tumor. Excretion urography cannot be relied on for the detection of

early filling defects and minute lesions of the renal pelvis. Retrograde pyelograms, supplemented by lateral views, provide shadows that are far better defined. By this means more adequate filling and a better concentration of the contrast medium is obtained.

Three additional generalizations, while not directly concerned with diagnosis, and not to be considered inviolable laws, may prove helpful:

1. Hemospermia does not usually bear the same serious implication as blood coming from other organs of the body. It usually originates from prostatitis, seminal vesiculitis or early benign prostatic hypertrophy, not usually from carcinoma of the prostate.

2. Contrary to common belief, hematuria occurs more frequently in cases of benign hypertrophy than in cases of carcinoma of the prostate. The reason is obvious: Benign hypertrophy originates in the periurethral glands, carcinoma in the periphery of the prostate.

3. Patients are always more alarmed about hematuria associated with pain than they are about painless hematuria although the latter is decidedly more ominous. Painful hematuria usually indicates urinary infection or calculous disease, whereas pain-

less hematuria more regularly signifies tumors.

Although careful execution of the non-instrumental steps outlined above suffices for the diagnosis of most urological conditions, it is just as important to understand their limitations as to know how to execute them, for in some instances additional studies are required. The overwhelming indication for instrumental examination is lack of a clear-cut diagnosis after non-instrumental study. The specific indications may be summarized by stating a few general principles:

Cystourethroscopy is indicated (1) to determine the cause of residual urine, (2) to identify the cause of unexplained urinary complaints.

Study of the upper tract is indicated (1) to determine the cause of unexplained failure of function of one or both kidneys reflected in the results of the total renal function tests or intravenous urograms, (2) to elucidate any obscure findings noted on intravenous urography, or to supplement intravenous urograms when no gross abnormality is noted but renal tumor is suspected.

A complete urological investigation, which includes cystourethroscopy, supplemented by ureteral catheterization when indicated, should be performed whenever the cause of hematuria, pyuria or bacteriuria is not explained by non-instrumental study.

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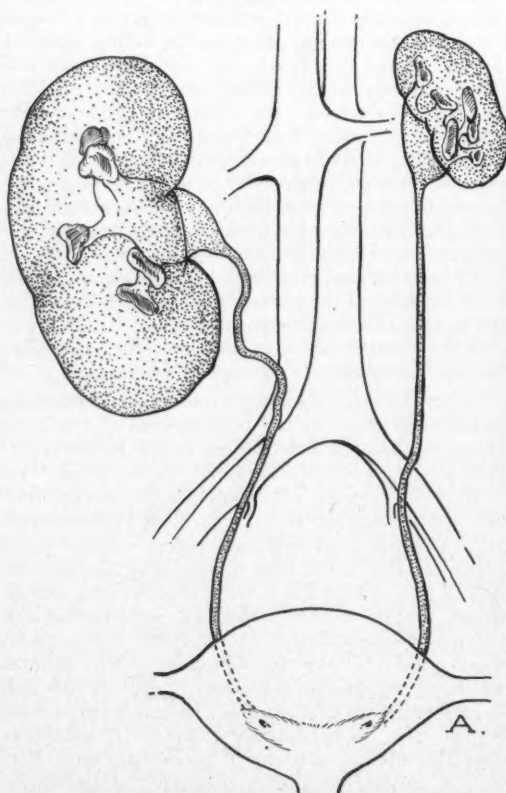


Figure 4.—Congenital hypoplasia of left kidney. Note narrow rim of secretory tissue insufficient to support life. Although superficial study of pyelogram (B) might suggest a normal left kidney, error in diagnosis is avoided by noting: (1) Narrow rim of parenchyma on left, (2) large size of right kidney due to compensatory hypertrophy, (3) infantile type of left renal pelvis.

## Medical Group Practice in California

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### SUMMARY

*A 1950 study of group practice in California reveals 52 "true general medical groups" among 123 medical organizations surveyed, involving 634 full-time and 215 part-time physicians. The groups, in contrast to the national patterns, tend to be larger, younger and more urban. There is also a greater tendency toward unit hospital affiliation (30 groups) and operation of group prepayment plans (10 groups).*

*In general similarity to the national scene, California groups are most frequently organized as private partnerships with a salary method of remuneration sometimes augmented by a share of net earnings. The range of medical and technical services offered varies widely with the size of the group.*

*The combination of group prepayment, medical group practice, and coordinated medical-hospital centers seems to offer special opportunities for satisfactory practice and adequate medical care.*

GROUP practice has developed as an increasingly significant form of medical organization in the United States. With the stated objectives of coordinating the technical complexity of modern medicine and achieving economy and efficiency of patient care, the group movement has attracted the attention of a growing number of physicians. Literature on the subject was recently summarized by the American Medical Association.<sup>1</sup> A comprehensive national survey of 368 medical groups was reported in 1946 by the Public Health Service.<sup>2-8</sup> The present study of group practice in California was undertaken to determine the nature of the movement in this state, and to compare it with the reported data for the nation as a whole.

### Definition of Group Practice

"Group practice" is a term used rather loosely with varied applications to the association of physicians in offices, clinics, hospitals and the like. For the purposes of this study, a fairly specific defini-

tion of "true" medical group practice was adopted in an effort to distinguish between formal group affiliation and the many limited forms of cooperation among physicians. The requirements of a "true general medical group" were established as follows:

1. A systematic association of at least three full-time physicians;
2. More than one specialty of medicine represented;
3. Joint use of office facilities and auxiliary personnel;
4. Formal organization for administration and financing;
5. Pooling of income and sharing of common overhead expenses, with net payments to physicians made according to a prearranged plan.

Thus, many types of medical affiliations were excluded from the analysis, for many did not satisfy all the five criteria.

### METHODS AND MATERIALS

In the spring of 1950, a list of all known groups, clinics, medical associations and the like was compiled from every available source—including the state registry of licensed clinics, the Public Health Service list of groups surveyed in 1946,<sup>9</sup> the files of groups participating in the California Physicians' Service and the personal knowledge of physicians and others throughout the state. A total of 123 organizations were listed. To each was sent a specially designed questionnaire, which had been previously field-tested and modified accordingly. Incomplete returns were followed up by mail and telephone. A representative sample of the 52 groups subsequently designated as "true general medical groups" were visited in person to validate the questionnaire and provide first-hand experience with existing group patterns.

*Response to questionnaire.* Of the 123 units canvassed, 92, or 75 per cent, completed the questionnaire. When the criteria of true group practice were applied to the data supplied, 52 groups, or 56.5 per cent of the units reporting, met the full requirements. These 52 groups, therefore, are the basis for the analysis which follows. This response and this proportion of "true" groups correspond quite closely with the experience of the national survey.<sup>8</sup>

### ANALYSIS OF FINDINGS

#### Extent of Group Practice

Current estimates for the United States as a whole indicate some 500 medical groups, with fewer than 5,000 physicians, full- and part-time. Although this constitutes less than 3 per cent of the active profession, there is much evidence (including the Amer-

From the Division of Medical Care Administration, School of Public Health, University of California, Berkeley. This paper is a summarization of a detailed survey of medical groups in California as compared with data on group practice for the United States as a whole. The full report, including complete tables and charts, is available upon request from the School of Public Health.

Technical assistance was provided by George S. Goldstein and Ann Waybur. Much of the basic data was accumulated as part of a graduate student project by Robert Hellman, M.D., Sterling Gill and Arthur Holstein. The study was financed in part by a grant from the Rockefeller Foundation to the School of Public Health.

ican Medical Association survey of 1945<sup>9</sup>) that many more physicians are interested in the movement and are undertaking less formal modes of group association. Of the 368 groups identified in the 1946 national survey, some 26 were listed for California, and the state had 315 of the 3,084 full-time group physicians reported at that time.<sup>8</sup> The present study, however, designated 52 groups and 634 full-time physicians for the state in 1950—although only eight of these California groups have been organized since 1946. These differences are important in comparing the national and state data for the two years.

The 52 California groups identified in 1950 involve a total of 849 physicians (634 full-time and 215 part-time), constituting about 8 per cent of the practicing physicians in the state. As there were 1,037 physicians connected with all of the 92 units which returned the questionnaire, it is suggested that an even greater proportion of the California medical profession is involved in some form of group affiliation.

#### Geographical Distribution of Groups

Medical group practice in California is predominantly an urban phenomenon; 55 per cent of groups and 73 per cent of all the group physicians

TABLE 1.—Distribution of Groups and of Physicians in Group Practice by County—California 1950

County	Groups		Physicians in Group Practice	
	Number	Per Cent	Number	Per Cent
All counties.....	52	100	849	100.0
Los Angeles.....	16	31	236	27.8
San Mateo.....	5	10	40	4.7
San Diego.....	4	8	46	5.4
Alameda.....	3	6	212	25.0
Santa Barbara.....	3	6	40	4.7
San Bernardino.....	3	6	40	4.7
San Francisco.....	2	4	77	9.1
Santa Clara.....	2	4	55	6.5
Stanislaus.....	2	4	13	1.5
Tulare.....	2	4	12	1.4
Yuba.....	1	2	12	1.4
Orange.....	1	2	10	1.2
Sacramento.....	1	2	9	1.1
Fresno.....	1	2	8	0.9
Riverside.....	1	2	8	0.9
Sonoma.....	1	2	8	0.9
San Luis Obispo.....	1	2	7	0.8
Kern.....	1	2	7	0.8
Placer.....	1	2	5	0.6
Santa Cruz.....	1	2	4	0.5

Percentages do not add up to 100 because of rounding.

are located in the two major metropolitan areas (Table 1). Los Angeles County has 31 per cent of the groups and 28 per cent of the physicians, while the San Francisco Bay Area has 24 per cent of all groups and 45 per cent of all group physicians. Of the ten groups operating their own prepayment plan, eight are in these two areas, and a ninth—in San Diego—is also located in a large urban community.

#### General Characteristics of the Groups

**Group affiliation.** Forty-eight, or 92 per cent, are private medical groups. The other four are industrial, cooperative and university-affiliated. This distribution is similar to the national pattern.<sup>2</sup>

**Primary activity.** All of the 52 groups are organized to provide general medical care. (Among the original 123 units canvassed, there were also eight single-specialty groups, two units practicing only part-time, and thirty less formal associations.)

**Size of group.** Table 2 reflects the great weight of the few very large groups now in operation. Although four-fifths (41) of all groups are small (fewer than eleven full-time physicians), they account for less than two-fifths of the total number of full-time physicians. But the six largest groups include over half of all the full-time physicians. In addition, two groups defined as small in terms of number of full-time physicians, nevertheless have a great many part-time members. Nationally, the groups tend to be smaller; California has twice as large a proportion of its full-time physicians in very large groups as has the United States.<sup>8</sup>

**Age of groups.** Group practice in the state is relatively mature; thirteen of the 52 groups are 21 or more years old, and 32 units are 11 or more years old. As might be expected, only five groups (10 per cent) were organized in California during World War II. In the five immediate postwar years, however, almost as many new groups were formed (15) as in the ten years preceding the war. Again, the national pattern is different—in that there is a greater preponderance of older groups. This is also reflected in the fact that the mean age of California groups is 14.3 years, compared with 19.9 years for the whole United States.<sup>3</sup>

**Form of organization.** Nearly three-quarters of the California groups are organized as partnerships—12 having partners only and 25 employing other physicians as well. Eleven groups are organized as single physician owner with employed physicians. In only three groups are all physicians employed by a

TABLE 2.—Size of Groups—California 1950

Size of Group (in Number of Full-Time Physicians in Group)	Groups		Total		Physicians Full-time		Part-time	
	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent
All groups.....	52	100	849	100.0	634	100.0	215	100.0
3-5.....	21	40	159	18.7	84	13.3	75	34.8
6-10.....	20	38	270	31.8	160	25.2	110	51.2
11-20.....	5	10	73	8.6	67	10.6	6	2.8
21 and over.....	6	12	347	40.9	323	51.0	24	11.2

Percentages do not add up to 100 because of rounding.

sponsoring organization. Table 3 presents the full distribution. This pattern is similar to that reported for the nation as a whole.<sup>5</sup>

*Size of community.* Although very few groups (5, or 10 per cent) are in rural communities, there is a fairly even distribution of groups in small, medium-sized and large cities (Table 4). Many of these small cities, however, are actually suburbs of metropolitan centers. The fact that the big city groups are also the largest means that the great majority of group physicians (73 per cent) are in metropolitan areas. When part-time physicians are eliminated from the analysis, however, there results a much more even distribution of full-time physicians among the small and large cities.

In contrast, the national pattern shows a greater proportion of groups in rural and small town communities, and fewer in the large cities.<sup>8</sup> In general, California group practice is a metropolitan phenomenon, while the characteristic national site is the small city.

*Interrelated factors.* No striking correlation exists between the size of the group and the size of the community—although only one group with more than eleven full-time physicians is located in a community of less than 25,000 population. In the

nation as a whole, however, there is a definite tendency for small groups to be in small communities and large in large.<sup>8</sup>

There is similarly no close relationship between size and age of group in California—although in the national pattern the older groups tend to be the larger as well.<sup>3</sup>

Considering the factors of size of community and age of groups, there is some slight evidence that the older units are located in the larger communities. This is true also for the nation as a whole.<sup>3</sup>

The size of the group bears definite relationship to the form of group organization. The larger groups tend to be predominantly organized as partnerships with additional employed physicians, while the smaller groups rely more upon the single physician owner and the partnership-only forms. This is equally true for the United States as a whole.<sup>2</sup>

The form of organization does not seem to be related to either the age of the group or the size of the community.

#### *Prepayment Characteristics of the Groups*

While almost all the groups care for patients enrolled in the various medical insurance plans operating in the state, there are ten which operate their own plan as an integral part of the group organization. These groups tend to be very much larger and more urban than those providing private fee services only. The prepayment groups are also more commonly organized by a sponsoring organization, more frequently are designed as partnerships with employed physicians, and tend to provide a broader array of medical and technical services. The mean size of California prepayment groups is 30.8 full-time physicians, as compared with only 7.8 for all others in the state and 11.1 for the nation as a whole.<sup>8</sup> The over-all proportion of groups with their own prepayment plan is similar for the state (19 per cent) and the nation (15 per cent), although over half of all physicians in California are in prepayment groups as compared with only 20 per cent for the United States (see Table 5).

#### *Hospital Relationships*

Eight, or 15 per cent, of the total number of groups in California operated their own hospital in 1950. Another 22, or 42 per cent, have a group affiliation with at least one hospital in the community. This compares with the national figure of 32 per cent of all groups having their "own hospital."<sup>8</sup> (Whether this means ownership or unit affiliation is not clear in the United States study.)

TABLE 3.—Form of Group Organization—California 1950

Form of Group Organization	Groups		Physicians	
	Number	Per Cent	Number	Per Cent
All forms.....	52	100	849	100.0
Partnership plus employed physicians.....	25	48	567	66.9
Partnership only.....	12	23	75	8.8
Single physician owner plus employed physicians.....	11	21	98	11.5
All physicians employed by sponsoring organization....	3	6	101	11.9
Other*.....	1	2	8	0.9

\*Questionnaire data not clear.

TABLE 4.—Distribution of Groups and Physicians by Size of Community—California 1950

Size of Community	Groups		Physicians	
	Number	Per Cent	Number	Per Cent
All communities.....	52	100	849	100.0
Under 5,000.....	1	2	5	0.6
5,000 - 9,999.....	4	8	35	4.1
10,000 - 24,999.....	12	23	83	9.8
25,000 - 99,999.....	15	29	183	21.6
100,000 - 499,999.....	10	19	287	33.8
500,000 and over.....	10	19	256	30.2

Percentages do not add to 100 because of rounding.

TABLE 5.—Distribution of Groups, and Physicians in Groups, With and Without Prepayment Plan—California 1950

Operation of Prepayment Plan	Groups		Total	Physicians—Full-time		Part-time	
	Number	Per Cent		Number	Per Cent	Number	Per Cent
All groups.....	52	100	849	634	100.0	215	100.0
Groups with own prepayment plan.....	10	19	483	308	48.6	175	81.4
Groups without prepayment plan.....	42	81	366	326	51.4	40	18.6

TABLE 6.—Occurrence of Medical Specialties—  
California 1950

Medical Specialty	Groups Having Each Specialty — (Total of 52 Groups) —	
	Number	Per Cent
Surgery .....	48	92
Internal medicine .....	45	87
Obstetrics-gynecology .....	44	85
Radiology .....	32	62
Pediatrics .....	31	60
Ear, nose, and throat.....	30	58
Eye .....	22	43
Orthopedics .....	22	43
Urology .....	22	43
Neurology-psychiatry .....	12	24
Dermatology .....	11	22
Pathology .....	10	20
General practice .....	6	12
Other* .....	8	16

\*"Other" includes the following: Allergy, 3 groups; Industrial medicine, 3 groups; Neurosurgery, 2 groups; Endocrinology, 2 groups; Aviation medicine, 1 group; Proctology, 1 group.

Four of the ten California prepayment groups operate their own hospital, while another three are affiliated as a group with a local facility.

Group-owned hospitals range in size from 15 to 300 beds, although one large state-wide group operates a network of hospitals now totaling about 500 beds. The United States range in 1946 was 6 to 350 beds, with a median of 48.<sup>8</sup>

#### Services Provided by the Groups

**Medical specialties.** Table 6 indicates that the specialties of surgery, internal medicine and obstetrics-gynecology appear to be basic to any group, with radiology and pediatrics commonly offered as well. The larger groups reported a wider array of specialties than did the small units, although dermatology and pathology were rare in all groups. About one-third of all full-time physicians in California group practice are certified as specialists by the American Boards. The national survey reported a greater amount of specialty service than is indicated in the figures for California.<sup>2</sup>

**Preventive services.** Regardless of size, most California groups reported that immunization, routine laboratory screening tests and periodic physical examinations are offered to their patients. But the organized types of preventive service—child health conferences, health education, and the like—are offered rarely, and then only by the larger organizations.

**Auxiliary technical services.** Basic laboratory services are rendered by most groups, while physical therapy is included by three-quarters of the groups. Other auxiliary services are relatively rare, and vary directly in rate of occurrence with the size of the group. Dietetic instruction is provided by less than 40 per cent of all groups, and less than 40 per cent have a pharmacy operating in association with them.

**Administrative and library personnel.** Most of the groups (89 per cent) have a full-time business manager, while only 56 per cent reported a full-time medical director. Only 23 per cent maintain the serv-

ices of a record-room librarian. This closely reflects the national pattern reported in 1946.<sup>8</sup> Again, most of the groups having such personnel are the larger ones.

**Ratios of full-time personnel.** The total number of full-time nurses in California groups (881) constitutes a ratio of 1.4 per physician. Groups with their own hospital, however, reported 2.8 nurses per physician, as compared with a ratio of 0.9 for clinics only. These figures are higher than the ratio of 0.55 nurses per physician reported in 1946 for the United States as a whole.<sup>8</sup>

The total of 238 technicians provides a ratio of 0.4 per full-time physician, again with a slightly higher ratio for groups owning hospitals. Administrative and clerical personnel occur in a ratio of 1.3 per full-time physician (2.1 for groups with hospitals and 1.2 for groups without). An over-all total of 2,798 full-time personnel was reported by the 52 groups.

#### Methods of Practice and Administration

**Initial choice of physician.** In two-thirds of the California groups, the patient himself determines the physician to whom he is initially referred. In the remaining one-third, this decision is made by a nurse or clerical receptionist. None of the groups appear to use a physician for initial evaluation. In the prepayment groups, 80 per cent accept the patient's initial self-referral.

**Patient-physician relationship.** In about one-half of the groups in the state, one physician assumes control of the patient's care throughout all episodes of illness and refers to the various specialists as indicated. In the other half, patients are directed at once to the specialist indicated by the chief complaint in each episode of illness. The smaller groups, however, use the central physician method much more commonly (67 per cent of these groups), while five of the six very large units refer patients directly to the indicated specialist.

**Medical records.** Almost all (90 per cent) of the groups reported that all medical records for each patient are kept in a single folder, and (in all but one case) this folder accompanies the patient throughout the various services of the group.

**Billing of patients.** In about one-half the groups, the patient is billed by the group as a unit, and the total charge reflects the number of referrals or consultations by different group physicians. In the other half of the groups, the patient is billed by the group as a unit (unit billing is implied in the criteria of group practice), but without regard to the number of intragroup referrals or consultations. Among this latter group, of course, are the ten prepayment organizations whose premium charges obviously do not relate to volume of service rendered the individual patient. Considering only the private fee groups, therefore, more use the former method (25 groups) than the single fee system (17 groups). The system of billing was found to bear no consistent relationship either to size of group or to form of group organization.

TABLE 7.—*Methods of Remuneration of Physicians in Group Practice—California 1950*

Methods of Remuneration	Physicians	
	Number	Per Cent
All methods .....	849	100.0
Salary (alone, or in combination) .....	712	84.0
Salary only .....	472	55.7
Salary, plus bonus or percentage of net profit .....	240	28.3
Percentage of net profit, only .....	63	7.4
Individual fees for service (alone, or in combination) .....	74	8.6
Individual fees for service, only .....	66	7.7
Individual fees for service plus percentage of net profit .....	8	0.9

*Methods of remuneration of physicians.* The great majority of physicians in group practice in California receive partially or entirely a salary form of income (Table 7). Over half have a straight salary, while another quarter receive a bonus or percentage of net profit in addition. The remaining minority are divided about evenly between percentage of net profit only and individual fees for service.

Payment methods are closely related to form of organization. Partnerships which employ other physicians emphasize the salary method, while the majority of partnership-only groups base incomes on the percentage of net earnings or on the individual fee method. Physicians employed by a single physician-owner are much more likely to receive a bonus or other additional income than are those employed by an outside organization.

*Criteria of remuneration of physicians.* The most common criterion reported was the owner or partner status of the physician (61 per cent of groups). About half consider training, accreditation, experience and professional status. More than one-third of the groups consider seniority in the organization. A relatively small number take into account the amount of service rendered or the number of patients brought into the group. The experience in the nation as a whole is similar,<sup>2</sup> and thus the emphasis in group practice is more on professional criteria and less on volume of work performed. This is particularly noted in the larger groups and in those with their own prepayment plans.

*Physician welfare.* All groups report various benefits specially organized for physicians. Ninety-eight per cent provide for vacations (92 per cent with pay), 96 per cent allow for rotation of on-duty status, 84 per cent provide sick leave, and 82 per cent allow attendance at medical conventions (although only 40 per cent pay their members' expenses at such conventions). Commonly included also are staff educational programs (71 per cent), leave of absence for postgraduate study (53 per cent); and professional travel or mileage expenses (39 per cent). An organized retirement plan is reported by only 20 per cent of the groups as against 32 per cent of 22 groups studied throughout the nation in 1947.<sup>4</sup> Again, the larger groups appear to provide such benefits more commonly than do the smaller ones.

*Research.* Twenty-two, or 42 per cent, of the groups provide facilities for medical research. Sixteen of these groups include in their budgets items for equipment and expenses for research. In 1950, nine of the groups had received outside gifts or grants for their research studies.

#### COMMENT

A few generalizations emerge from the mass of data. The 52 medical groups in California in 1950 involve a significant segment of the medical profession of the state—and represent a growing trend. In contrast with the national pattern, the California groups are younger, larger, more urban, and more commonly associated with hospitals and prepayment plans. The four very large groups in the state tend to dominate the statistical picture, and determine the most characteristic aspects of the California pattern.

The relative stability and long history of the medical groups is significant, as is the rate of formation of groups in the postwar years. These newer groups, interestingly enough, tend to be smaller and less urban than the general pattern. As in the rest of the country, the salary method of payment and the private partnership form of organization predominate, especially in the large and prepayment groups.

#### Weaknesses

The data as reported indicate a definite gap between the promise and the practice of group medicine. This is reflected in various aspects of group organization and function.

A basic theoretical advantage of group practice is the coordination of complex modern medical services for the individual patient—or even better, the individual family. This calls for a nucleus of broadly oriented general physicians who function as personal health counsellors, calling upon and coordinating the specialty consultants as indicated in each case. Thus, central patient responsibility and continuity of patient care can be combined with the full array of specialist and technical service.

This survey reveals that most groups in the state are organized by specialists, that at least half assign the patient directly to a specialty department for each episode of illness, and that either the patient or a receptionist decides upon this initial selection of specialist. This "fragmentation" process—a basic characteristic of medical practice in America today—appears more commonly in the larger urban groups than in the less complex organizations.

In some groups, practical barriers still exist to the intragroup referral of patients—supposedly a functional essence of one type of group practice. In half the groups studied, the patient pays additional charges for each referral, and almost one-third of groups base payments to physicians at least partially on the number of patients handled by each individual physician. In the prepayment groups the physician and the patient may avoid economic deterrents, which exist in certain plans, to intragroup referral.

Group practice has an unusual potential for preventive medicine, since the team of trained personnel in group medical centers has greater facilities for the special techniques of prevention than does the solo practitioner. The data show, however, that relatively little emphasis is given by California groups to the planning of organized preventive services—although the individual techniques (immunization, health examination, etc.) are commonly reported. A related observation is the relatively rare employment of such auxiliary personnel as public health nurses, social workers, nutritionists, health educators, etc., who could immeasurably enhance the preventive program, while increasing the quality and economy of the over-all group service.

A final comment relates to the persistence of elements of economic competition among physicians in a group. An important advantage of one form of group practice lies in the elimination of professional competition and its replacement with cooperation and financial sharing. While this is true of a considerable portion of California groups, there remain significant differences among the units studied. In some of the groups, the individual physician benefits financially by retaining rather than referring the patient and competes with his colleagues in terms of volume of service rendered. The over-all income of the unit reflects the total number of visits and operations in all but the prepayment groups. A few of the groups still reimburse physicians according to the number of individual services rendered to each patient.

#### *Advantages*

To a considerable degree the theoretical advantages of group practice are demonstrated in the California experience. Almost all of the groups maintain their own coordinated medical center for the efficiency of physicians and the convenience of patients. Over half are able to maintain group practice in the hospital as well.

The administrative arrangements that constitute group practice free physicians from business dealings with patients, guarantee them a secure and steady income, provide comprehensive clinical facilities and auxiliary personnel, make possible ready consultation and referral relationships, provide a

regular schedule of duty and free time, and present special educational and research opportunities.

In general, the groups bring together a fairly broad array of specialists and auxiliary personnel and provide basic laboratory and other technical facilities, thus enhancing the potential for scientific practice and for comprehensive service to patients.

The personal advantages to physicians—in terms of economic security, vacations and sick leave arrangements, travel subsidies, etc., are well demonstrated. The stability and growth of older groups and the appearance of new ones testify to the attractiveness of the general arrangements to many physicians.

A highly significant impact of the medical groups on professional practice in the state is the shift in them away from the traditional pattern of individual fees for each item of service rendered, to the group method of guaranteed income with sharing of net surplus based upon professional qualifications.

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## Conservative Amputation in Arteriosclerosis Obliterans

JACK FLASHER, M.D., and HERBERT B. RUBIN, M.D., Los Angeles

### SUMMARY

*Sixty-three toe and leg amputations in patients with arteriosclerosis obliterans were reviewed in an attempt to determine how often and under what conditions a toe or leg amputation gave satisfactory results, and when transmetatarsal amputation might better have been considered. In many cases in which toes were amputated, it was necessary later to amputate the leg or the thigh because of improper healing or spread of infection. Transmetatarsal amputations apparently heal frequently in carefully selected cases and permit better function in the foot than do toe amputations. Successful use of a prosthesis is not obtained in many cases after leg amputation. When this difficulty is anticipated transmetatarsal rather than leg amputation should be attempted, if other conditions warrant, since prosthesis is not necessary after transmetatarsal amputation.*

McKITTRICK and co-workers<sup>3</sup> recently reported encouraging results from transmetatarsal amputation in patients who had both arteriosclerosis obliterans and diabetes mellitus. They stated that patients who formerly would have been subjected to amputation of one or more toes or even of part of the leg received more benefit from the transmetatarsal operation.

To appraise the conclusion reached by McKittrick and co-workers, a study was made of case records with a view to determining, first, how often and in what circumstances toe or leg amputation gave satisfactory results, and, second, whether transmetatarsal amputation might better have been considered.

### REVIEW OF CASES

At Los Angeles County Hospital histories were reviewed of 49 unselected cases of patients with arteriosclerosis obliterans, some of them with diabetes mellitus, upon whom amputation of a toe or toes or through the leg had been performed because of a lesion related to ischemia. A total of 63 amputations had been done on 57 limbs. Ages of the patients at the time of amputation ranged from 40 to 82 years; the average was 63 years. Thirty-two were men and 17 women. Of the 57 limbs that were operated upon, 43 were those of patients who had

diabetes mellitus. One patient who underwent amputation on both limbs had had Raynaud's phenomenon for many years in addition to arteriosclerosis obliterans. All the amputations were performed at least three and one-half years before the study here reported, an interval adequate for follow-up.

One or more of the toes were removed in 30 of the amputations and part of the leg in 33. After 21 of the toe amputations a subsequent amputation to the leg or thigh was carried out (six of these operations are included in the 33) because healing did not progress notably in one or two months or because of spreading infection. In three instances the patient died after the second amputation.

Healing took place after only nine (30 per cent) of the toe amputations (Table 1), and was usually slow. In many instances considerable distortion of the remaining toes occurred after operation, and in most such instances callus and ulceration developed on the metatarsal heads, on the outer aspects of the first or fifth toes, or on the toes adjoining the amputation site. Removal of the great toe did not appear to cause the patient great difficulty in balancing or in stepping forward to walk. The over-all impression of results from toe amputation was not encouraging, even when allowance was made for the greater age and poor general condition<sup>1</sup> which commonly are factors in patients in charity hospitals.

Healing occurred in 24 of the 33 cases in which amputation through a leg was carried out, and it was much more rapid than after toe amputations. In the other nine cases the patient either died post-operatively or later underwent thigh amputation. Of the 24 patients with amputations that healed, nine did not use prosthesis, and of the 15 who did, only four continued use of the device for a year or more. Some of the patients who did not use a prosthesis for a full year probably could have done so. Eight of those who did not use a prosthetic device at all or abandoned its use within the first year, nevertheless seemed to benefit from the amputation, for they had greater use of the limb (as in turning in bed or sitting) than they could have had after amputation through the thigh. Among the reasons for abandoning or not using a prosthesis were these: The patient found crutches satisfactory; the patient died of other causes in the year after the prosthesis was applied; the prosthesis was difficult

TABLE 1.—Amputation in Arteriosclerosis Obliterans.

	Total Number	Healed	Reamputated	Died
Toe .....	30	9 (30%)	21	3*
Leg .....	33	24 (73%)	5	4

\*All died after reamputation.

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TABLE 2.—Use of Prosthesis in Leg Amputation

Number Successfully Amputated	Used prosthesis for over one year	Could not use prosthesis	Use of prosthesis conditional or uncertain
24	4	9	11*

\*These 11 benefited somewhat from the leg amputation (as opposed to a thigh amputation) even though they did not use a prosthesis for at least one year.

to use because the other limb also had or needed a prosthesis; pressure of the prosthesis caused recurrent ulcers; or contracture of the knee developed. The subsequent use of the limb upon which operation is done is important because most of the patients were alive two to ten years after amputation.

Death followed amputations in seven cases, in four of which amputation of the leg was carried out, and in the other three amputation of a toe or toes, followed by amputation of the thigh (during the same hospitalization) when that became necessary because of spreading infection in one case and non-healing in two. In all seven cases death was related to cardiovascular disease and/or sepsis.

#### DISCUSSION

In the present group of elderly patients with arteriosclerosis obliterans, many with diabetes mellitus, toe amputations usually did not heal. McKittrick in 1939 reported healing in only ten per cent of such cases.<sup>2</sup> His advice at the time was the performance of thigh (supracondylar) amputations in a greater number of cases. However, in light of his more recent experience with transmetatarsal amputation it would appear that this operation might well be tried more often instead of toe amputation if local conditions are conducive to technical success and if arterial insufficiency in the patient is only moderate.

In the cases studied, neither sex, age, the presence of diabetes, nor the palpability of the arterial pulses alone appeared to be correlated with the success of the amputation. Apparently in the selection

of the site for amputation no one of these indices can take the place of an adequate survey of the degree of arterial insufficiency present as measured by arterial pulses, claudication distance, pallor of the limb when elevated and rubor when dependent, appearance of the skin, speed of color return (venous filling time), ischemic pain on rest, and the implication of any trauma in the production of the lesion.\*

The evidence presented concerning the healing and usefulness of the limb after amputation of the leg suggests that transmetatarsal amputation might well be tried in place of leg amputation in some cases, especially in those in which it is suspected that the patient will not be able to wear a prosthetic device. As transmetatarsal amputation makes greater demands on the peripheral circulation, careful appraisal of the adequacy of the supply of blood must be made, since unsuccessful amputation and consequent reamputation would entail a greater risk in a condition already associated with a high rate of operative mortality. The advantage of transmetatarsal amputation over amputation of the leg is that if healing takes place the limb can still bear weight without a prosthesis. This advantage sometimes makes the difference between an ambulatory and a partially invalid patient.

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\*It must not be forgotten that, as Samuels<sup>4</sup> has amply illustrated, many lesions of the toes can heal without surgical amputation if ideal conditions of treatment prevail, although the prolonged hospitalization or bed rest required and the financial considerations involved might make such therapy impracticable.

## The Relationship of the Referring Physician to the Psychiatrist

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### SUMMARY

*The relationship of the referring physician to the psychiatrist is believed to be of a different order than that of most physicians to one another. Certain facts are postulated as playing a role in this somewhat difficult relationship and examples from actual practice are offered as evidence. Among possible points of discord are mentioned: The length and cost of psychotherapy and relative youth of the specialty, the referring physician's hostile feelings toward it, and the unhelpful attitude of certain psychiatrists.*

**O**FTENTIMES a physician, in referring a patient to a psychiatrist, seems to have difficulty that he would not have if he were referring to a colleague in another specialty. It seems also that if the psychiatrist is a psychoanalyst or one who does not practice neurology (often a convenient pretense for referral) the difficulty is increased. A psychiatrist may interview a patient, referred because of headache, tremor, fatigue or even "nervousness," who has been directed by the referring physician to see Dr. Smith to have his "nerves checked up." And the patient, becoming indignant when the psychiatrist starts questioning him about his emotional problems, may say: "Dr. Jones sent me here for an examination." That this situation is in many instances the fault of the referring physician (and not just the patient's delicate feelings) is clear from the fact that a psychiatrist may get consistently well-managed referrals from certain physicians.

Physicians are as a rule well aware that they live perpetually in the shadow of their own ignorance; and, having the welfare of the patient at heart, they welcome special or additional knowledge from a colleague. Why, then, can a specific referral, namely, to a psychiatrist, be difficult? The reply to this question most often obtained from the referring physician is that it is so difficult a matter to broach—that the patient will feel the physician is implying he is crazy. Next most common, in the author's experience, is the answer that when the idea of seeing a psychiatrist was brought up, the patient refused it. Consider some examples:

A woman, 29 years of age, was referred by an internist because of tremor of the hands. The patient had been examined by a number of physicians during the previous years, had been thought to have disease of the thyroid gland, and had been given many forms of medication. When the psychiatrist started to question her about her symptoms and

about the feelings related to them, the patient became actively hostile. She stated that she had seen some wonderful doctors in the last year, that nobody had told her that hers was an emotional problem, and that she was sure the doctors felt it was her "glands." On further questioning, she revealed that she was frightened and discouraged by the symptoms since they had not responded to treatment and had increased to the extent that she could not competently perform her work. She further stated that if hers was an emotional symptom she would handle it herself, and concluded the interview a short time later, rather abruptly, in tears.

A 29-year-old man consulted an internist because of pain in the right lower quadrant of the abdomen. The internist took a careful history and made a thorough physical examination. He noted that the colon was rather tender throughout. He informed the patient that this was probably attributable to emotional tension, but that he felt that radiologic examination with barium enema should be carried out in order to rule out other possibilities. No abnormalities were noted in the roentgen studies. The patient was so informed and was referred to a psychiatrist immediately. He came to the psychiatrist with the statement that the internist had ruled out the possibility of physical disease, that he was relieved to know it, and that there were reasons in his life for the emotional disturbance that might be manifest in colonic tenderness. The patient had weekly interviews for eleven weeks and during that time the symptom disappeared. It was necessary to discontinue treatment, as he was leaving for another part of the country. However, the patient expressed interest in getting long-term help for several other things he had noticed about himself, when he could afford it.

Dr. A., the physician who referred the patient in the first of the two cases reported as examples, is an overworked internist who additionally burdens himself by supporting a large number of severely neurotic persons with various drugs and reassurances that chronically tie patients to him. The occasional patient he sends for psychiatric interview is usually a hostile, aggressive person with whom Dr. A. expects the psychiatrist to accomplish miracles in one interview. As a result, Dr. A. earnestly believes that psychiatrists are of no help to him.

Dr. B. who referred the young man with the spastic colon is an excellently trained internist who himself received psychiatric help for an emotional upset that occurred during the course of his residency. The patients he refers to the psychiatrist are usually less apprehensive and better informed about what they can expect of the consultation.

On the other hand a physician may refer a patient to a psychiatrist and be disappointed in the outcome for a number of reasons. Consider the following:

A general practitioner referred a man 24 years of age to a psychiatrist because of a diagnostic problem involving head-

aches. The psychiatrist in an hour-long interview informed the patient that the headaches were owing to "repressed hostility," and that he needed a number of interviews to work out hatred toward his mother. The patient did not return to the referring physician, who next heard of the case when the patient's indignant mother phoned to upbraid him for sending her son to someone who was encouraging him to "wreck their home." In addition, the referring physician learned that the psychiatrist charged \$15 for the interview, whereas he himself had charged only for laboratory studies because of the family's financial status.

Dr. C., a psychiatrist, receives referrals from a number of physicians, at least in part because he is one of the few psychiatrists in the area. His fees seem overly large to his colleagues, he rarely discusses his findings with the referring physician, and his letters are replete with psychiatric jargon. After a number of visits to his office, the patients seem to find their way back to the referring physician. Dr. C. earnestly believes that the physicians in his area are not psychiatrically oriented.

It would seem that certain unrealistic attitudes and preconceived notions on the part of the referring physician and the psychiatrist make for difficulties between them. These difficulties are obviously exaggerated when either of them has personality difficulties that make collaboration impossible, or when the referring physician has a negative attitude toward psychiatry and psychoanalysis. In one group of referrals, three physicians referred seven patients ostensibly for neurological examination, and in none of the seven was neurological disease noted. On the other hand, two physicians referred six patients for psychotherapy and four of the six agreed to undergo psychotherapy including one who began psychoanalytic therapy.

The complaints about psychiatric referrals made by referring physicians seem to fall into the following categories: (1) Psychiatrists want to do too much, and therefore psychotherapy takes too long. (2) Psychotherapy is too expensive. (3) The results of treatment are poor. (4) Psychotherapy encourages patients to become too dependent on the therapist and to feel "sorry for themselves." (5) Psychiatrists are crazy or peculiar themselves. (6) Psychoanalytic theory is a lot of jargon—"especially the stuff about sex." It would perhaps be worthwhile to consider each criticism separately.

#### 1. *Psychotherapy takes too long.*

The natural history of medicine has been one of increase in specialization. The more that is discovered, the more arborized become the pathways of discovery. Hence it is not surprising that the fifty or so years of increasing interest in psychiatric treatment has increased realization of the complexity of the human mind and has increased awareness of the kind and extent of required intervention. It is recognized that at present there are no short-cuts to effecting durable relief to someone with severe difficulties in living. No amount of wishful thinking, zealous shoulder-patting or exhortations to improve will more than scratch the surface of neurotic processes. Physicians do not feel defeated or frustrated because a patient with chronic rheumatic heart dis-

ease remains under continuing treatment the rest of his life. Why, then, should there be a double standard with regard to people who are emotionally upset—be they neurotic, psychotic, or otherwise?

Consider the remark of an eminent medical teacher: "I want you to meet Dr. X., our new psychiatrist. He is a very good man; he doesn't go too far with his patients." This is not to say how far he does go, but implies there is a tendency on the part of psychiatrists to go "too far." How far is that? Suppose that, instead of a psychiatrist, it was a surgeon who was being presented and that it was said of him that he was a good man because he judiciously confined himself to matters outside the dark and mysterious realm of the peritoneal cavity.

#### 2. *Psychotherapy is too expensive.*

A psychiatric interview on the average must last nearly an hour. This means that the psychiatrist cannot treat more than seven or eight patients a day, especially if he is to remain alert and intuitive. It is apparent he must charge proportionately greater fees per patient in order to compensate for the lack of volume. Statistics released by the sixth economic survey of *Medical Economics* in May 1949 revealed that psychiatrists have less gross income than most other specialists. In addition, it must be remembered that the training of a psychoanalyst takes longer and costs more than does the training of any other specialist. Oddly, the ability to do psychotherapy requires the most extensive training, yet is less remunerative to psychiatrists than shock treatment, consultations, etc.

#### 3. *The results of psychotherapy are poor.*

A statistical survey of the results of psychiatric treatment cannot be presented simply. This is because results depend to a large measure on the skill of the therapist (hence differing from the treatment of infectious diseases with penicillin, where the therapeutic agent is of prime importance), on the amount of time spent with any one patient (from one interview to interviews over several years), and on the degree of disorganization of the patient's interpersonal processes. A psychiatrist relies on the ego strength of the individual and his drive toward mental health to aid the therapeutic efforts. With some patients the psychic processes could be compared to exhausted bone marrow that can no longer mobilize leukocytes to aid the physician in the fight against infection. It would seem, in general, that individuals become mentally ill as a result of unfortunate experience. There is no theoretical reason to indicate that judicious psychotherapy should not be a fortunate experience. This is in contrast to the "better let well enough alone" attitude so often expressed in reference to emotionally ill people.

#### 4. *Psychotherapy encourages patients to feel sorry for themselves.*

It seems to be difficult for most persons in our culture to give credence to the idea that the individual does the best he can at any given moment. Why should it be otherwise, when we all would rather be comfortable than in distress? The terms "lazy,"

"stubborn," "no will power" are not merely descriptive but imply moral censure and an unspoken "he could do better if he wanted to." Hence, a psychiatrist is up against social prejudice when he attempts to point out that certain dynamic interpersonal processes over which the individual has no control are responsible for his character traits. When the individual becomes aware of his dealings with others he adopts more healthy patterns. This is not to say that individual psychiatrists may not encourage patients to become dependent upon them (for various reasons—including prestige, power, financial gain or the physician's despair). It is to say, however, that there is nothing in the psychiatric process that makes such dependence necessary.

#### 5. *Psychiatrists are crazy or peculiar themselves.*

The abundant jokes about psychiatrists are ample evidence that many people in our culture are afraid of their unconscious feelings and hence resent and fear psychiatry and psychiatrists as though they were mind readers. It is natural for them to attempt to dilute this fear by finding flaws in those of whom they are in awe. In addition, psychiatrists like other physicians have emotional reasons for choosing their particular specialty. As in any young science that is fighting for recognition, there are many radicals and reformers among the early proponents, many whose emotional problems make them zealots. Many psychiatrists also attempt to solve their own problems by treating patients. As the field has gained greater acceptance in recent years, the number of relatively stable young men entering it has increased.

#### 6. *Psychoanalytic theory is a lot of nonsense.*

The average physician who sits down and reads a treatise on psychoanalysis is generally more incredulous than curious. He does not treat it with the same respect an equally incomprehensible article on neurophysiology would receive. Perhaps a partial reason is that although few of us would claim to be or expect ourselves to be, experts in many of the various facets of medicine, most of us claim to know a good deal about human motivation and behavior—and especially about ourselves! In addition, we have some carry-over of our childhood days in our feelings of curiosity and disgust toward sexual matters, and in our fear of the unknown, the unfamiliar. It is interesting that the most eloquent and vociferous denunciators of psychoanalytic theory are, in general, those physicians who practice no systematic psychotherapy—who never, therefore, put themselves in the position of discovering whether or not certain of the tenets may be supported. In addition, psychoanalysts may interview a patient several hundred hours; therefore, they reach a depth of psychic material that cannot be judged in terms of meeting with a patient a few times. It is equally true that psychiatrists and psychoanalysts should mend their ways if they would have greater acceptance by other physicians. In the last few years there has been a real attempt on their part to "clean house"—especially in regard to their mysterious and incomprehensible language. They also would do well to regard

with curiosity and skepticism the universality and absolute veracity of some of their claims.

All the foregoing factors are operating when a physician refers a patient to a psychiatrist. Perhaps another example from actual practice would further this point:

A woman was hospitalized for ulcerative colitis. After life-saving medical treatment she was referred for psychiatric consultation, and it was decided she should undergo psychotherapy after leaving the hospital. After a year of therapy (one-hour interviews twice a week) she was having diarrhea only once or twice a week and an internist examined her occasionally. She was receiving vitamins and ferrous sulfate, no other medications. At this point the patient became pregnant, and this precipitated another acute attack which did not respond to medical therapy including a prolonged course of streptomycin. The psychiatrist felt that the pregnancy brought out strong unconscious fears and resentment in the patient and that this was responsible for the sudden remission. The internist urged colostomy. In alarm, the patient's family turned to the psychiatrist who felt he could not interfere with the medical treatment, but persuaded the internist to call in consultation a leading authority on that disease. The consultant felt that psychotherapy was benefiting the patient and recommended it be continued. He stated that although the patient had slight anemia and was having six to eight bowel movements a day, her state of nutrition was good and there was no need at present for heroic measures such as colostomy. From then on relations between the internist and psychiatrist became increasingly difficult. The patient, although she needed medical supervision, stopped seeing the internist because he would in an oblique manner try to undermine her belief in the efficacy of the psychiatric treatment. He also attempted to persuade the patient and her husband to get her to take a two-week trial of chloramphenicol. The psychiatrist did not take time to talk the situation over with the internist at such length that he could convince the other physician of the rationale for psychotherapy. The situation was finally resolved when the patient returned to the specialist, who had been called in consultation, who in turn referred her to another internist in the area with whom the psychiatrist was able to work out a happier relationship.

It would seem, then, that a situation such as that described, which is not unusual between psychiatrist and referring physician, might be owing to a number of factors that are constantly operating between the two physicians. Psychiatry has only recently come of age, and the referring physician has great doubts as to its value and great expectations as to how quickly results should be forthcoming. His skepticism is only increased by his over-evaluation of the psychiatrist's ability. Psychiatrists have not done enough to explain their science without over- or under-selling it. Some psychiatrists who have not had much experience with psychotherapy over-emphasize the value of the organic treatments (such as shock, or lobotomy) and increase the non-psychiatric physician's doubt of the benefits of psychotherapy. The reaction of the physician against psychotherapy may stem also from another source: all persons, and hence physicians too, fear exploration of that part of their mental processes which is out of their own awareness. Therefore, it is possible that the referring physician despite his reasonable self,

unconsciously fears and hence feels hostile toward psychiatry. Despite his conscious wish to help the patient, the physician may unconsciously be putting blocks in the way of referring his patients for emotional help, or may unconsciously be interfering with the psychotherapy once it is under way. If the psychiatrist, on his part, does not take this into account, and instead behaves as if the referring physician were simply being unreasonable, then the situation will become increasingly difficult and unworkable.

Experience in psychotherapy leads to at least one

outstanding truth—that unreasonable fears and quiet doubts are subject to change once they come into awareness. It is possible that increasing frankness between the psychiatrist and his non-psychiatric brethren will result in expediting the welfare of the patient. To make use of an implication in discoveries of recent years of the interdependency of the psyche and the soma: the psychiatrist and the non-psychiatric physician must establish the same sort of homeostasis that they are attempting to establish in the patient.

Palo Alto Clinic.



### Doctor Shortage?

Speaking before the President's Commission on the Health Needs of the Nation, Frank G. Dickinson, Ph.D., director of the Bureau of Medical Economic Research of the A.M.A., said that "there has not been to date a realistic study which supports any valid claim that a national doctor shortage is pending."

"Since people need everything," he said, "it can be safely assumed that there are unmet needs for medical services, legal services, dental services, Grade A milk, shoes, and any other goods or services which sell for a price. Since all needs are relative, it follows that all unmet needs are relative. Any approach to the study of regionalization will fail at the start if it is based upon the notion that unmet needs are absolute."

—From the American Medical Association's *Secretary's Letter*

## Relationship of Delivery Date to Predicted Date

EDWARD LISTON, M.D., *Palo Alto*

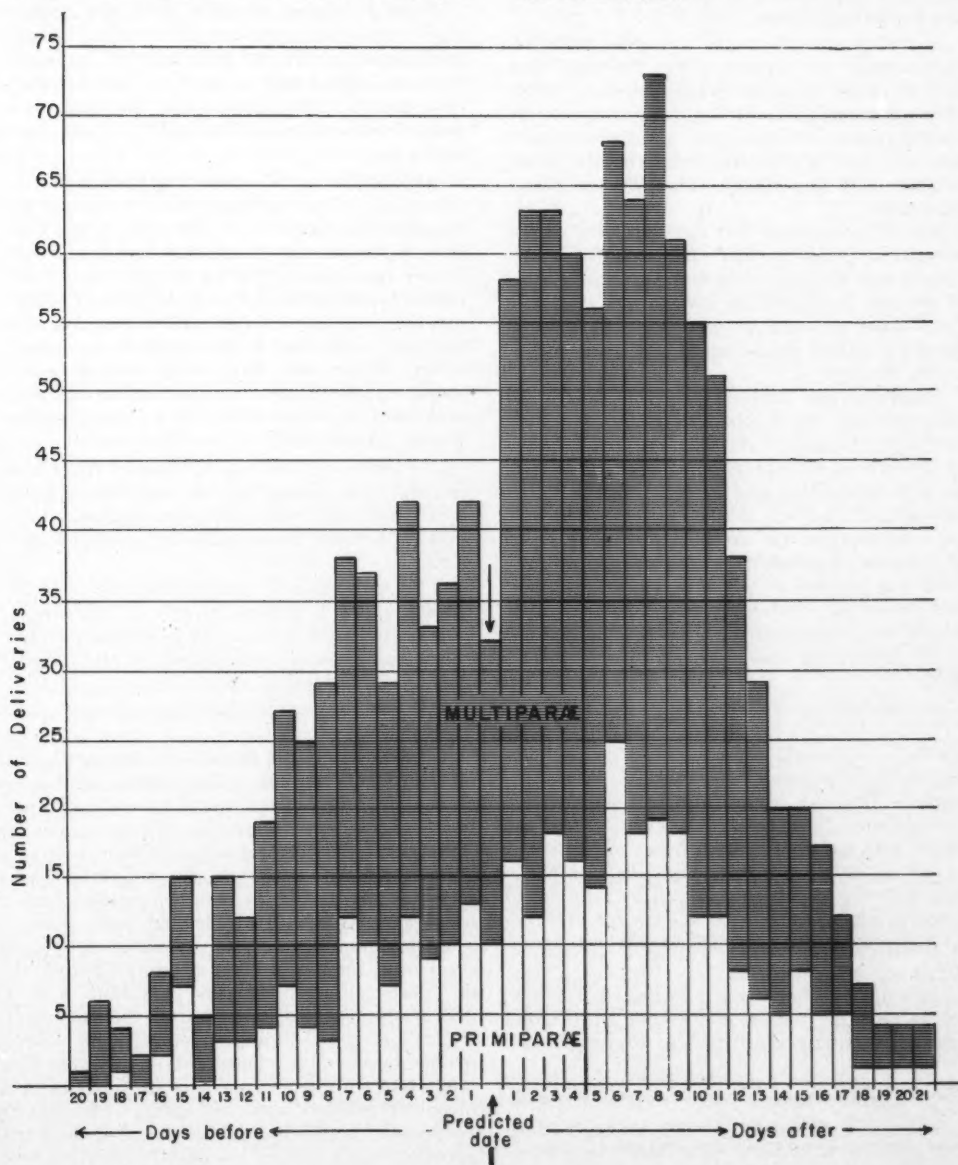
DATA on 1,300 consecutive deliveries at the Palo Alto Hospital in the period September 1950 to April 1951 were reviewed with regard to the actual delivery date in relation to the predicted date. The predicted date was 280 days after the first day of the last menstrual period.

Data on 1,284 cases are charted below. Delivery was early in 425 cases, late in 827, and on the pre-

dicted date in 32. Not on the chart are 16 cases in which delivery was more than 21 days early or late. More than three weeks early were two primiparae, five multiparae; more than three weeks late, three primiparae, six multiparae.

The data confirm a clinical impression that delivery is twice as likely to be late as early.

300 Homer Avenue.



# Relation of a Streptococcus to Epidemic Poliomyelitis

## Studies in Etiology, Diagnosis and Specific Treatment

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### SUMMARY

The production in 1915 of herpes zoster or "posterior" poliomyelitis in animals with a streptococcus led to further research on the etiologic importance of streptococci in "anterior" poliomyelitis.

A specific streptococcus was demonstrated consistently in persons with poliomyelitis and in well persons having contact with them or merely inhabiting an area in which poliomyelitis was epidemic. That the organism was not present in areas remote from contact with the disease was likewise demonstrated.

The streptococcus has been isolated from filtrates of poliomyelitis virus and from the tissues and exudates which harbor the virus. It appears in the spinal fluid in the preparalytic stage of poliomyelitis and disappears from the spinal fluid during the severe stage of the disease.

Antibody and antigen prepared from the streptococcus were used to determine the presence of antigen and antibody indicative of streptococcal infection in many patients with poliomyelitis and in well persons. The intensity of reaction indicating specific streptococcal antigen was directly proportional to the degree of paralysis in patients; the reaction was greater in persons whose age, sex and previous isolation from the disease would normally indicate greater susceptibility. The test for antibody gave opposite results.

Specific agglutinins for the streptococcus and neutralizing antibody for the virus were present consistently in the serum of persons and monkeys during recovery from poliomyelitis.

Virus produced *in vitro* from the associated streptococcus caused all the clinical and pathologic features of poliomyelitis in monkeys inoculated with it, and the animals that recovered from the disease thus induced were proved to be immune thereafter to the natural virus.

Antistreptococcal serum prepared in horses was used to treat poliomyelitis. In a group of monkeys inoculated with the virus of the disease, 6 per cent of those receiving the serum before inoculation died of the disease; of the control group, 82 per cent. In a series of poliomyelitis patients treated with the serum the mortality rate was 8 per cent; in a control series, 21 per cent. In a series treated in all stages of the disease by the author, 10 per cent died; of those who did not receive the serum, 25 per cent.

An antibody has been prepared from the streptococcus which appears to prevent paralysis and otherwise mitigate poliomyelitis and to provide immunization from the disease.

The conclusion is reached that the virus of poliomyelitis is a form of the specific streptococcus, which is the agent in primary infections and in the development of the immunizing antibody.

**P**ROOF that epidemic poliomyelitis is caused by a filtrable agent currently considered to be a virus is complete. That the clinical and pathological features of poliomyelitis occur in monkeys inoculated cerebrally with emulsions and filtrates of emulsions of the spinal cord of persons who died of poliomyelitis, and that these features can be reproduced in rhesus monkeys throughout a series of brain-to-brain transmissions is established beyond peradventure.

The influence so often exerted by current concepts in determining the nature and course of original research is strikingly illustrated in studies on the

inciting agent of this disease. Bacteriologic studies prior to 1909 indicated that certain diplostreptococci that were isolated might have significance in the etiology of poliomyelitis. These studies were quite naturally dropped when in that year it was learned that the causative agent is filtrable; in consequence, forthright bacteriologic studies have not been generally used for more than forty years.

During studies on elective localization of streptococci in 1915,<sup>14</sup> the author produced herpes zoster or "posterior" poliomyelitis in rabbits and dogs with a streptococcus isolated from the nasopharynx, tonsils and spinal fluid of humans.<sup>1</sup> This result led to the concept that a specific type of streptococcus might have etiologic importance in "anterior" poliomyelitis regardless of the filtrability of the causative agent and might indeed be the source of the filtrable agent.

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Opportunity to put this idea to test was presented in Rochester, Minnesota and New York City during the epidemic of 1916. Guinea pigs and rabbits were inoculated with the streptococcus isolated from the nasopharynx and spinal cord of persons who were ill with or had died of poliomyelitis. Flaccid paralysis (often fatal); atrophy and deforming contractures of muscles in animals that survived severe paralysis; death from respiratory failure; edema; hemorrhage and degeneration of nerve cells in the anterior horns of the spinal cord—the all-important occurrences in poliomyelitis—were produced in high incidence.<sup>15</sup> Such symptoms and lesions almost never occurred in animals inoculated with streptococci similarly isolated in studies of other diseases. In short, the specific streptococcus, when injected intravenously into animals, tended to localize electively and to cause systemic lesions like those occurring in patients from whom the organism was taken.<sup>14</sup> Mathers<sup>6</sup> and also Nuzum and Herzog,<sup>8</sup> using the same methods, reported similar results in studies of epidemic poliomyelitis in Chicago. The demonstration of pleomorphic cocci and diplostreptococci in the lesions of the spinal cord in poliomyelitis,<sup>15, 1, 2, 16</sup> the occurrence of streptococcal antibodies in convalescent serum,<sup>16, 17, 18, 7, 4</sup> and the production and use of antistreptococcal serum in treatment soon followed.<sup>19, 20, 9</sup>

Convinced of the epidemiologic and etiologic importance of the streptococcus, and recognizing that no practical means for specific prevention and treatment had resulted from the purely viral studies, the author continued making further streptococcal and viral studies of epidemic and experimentally produced poliomyelitis, as opportunity was afforded, from 1916 to the present. This research will be briefly reviewed with citations of the original publications in which the methods used are described. Corroborative results obtained by other investigators will be indicated. The reasons for omitting certain phases of the author's work are set forth in a monograph on poliomyelitis.<sup>20</sup>

#### I. Isolation and Microscopic Demonstration of the *Streptococcus in Poliomyelitis*

In seventeen epidemics studied, a specific type of nonhemolytic or green-producing, often pleomorphic, streptococcus was isolated consistently, by the special methods employed, from a number of significant sources: (a) from the very tissues and substances that harbor the virus, such as the nasopharynx and the feces of persons with the disease; (b) from the nasopharynx of persons who had had contact with others who had the disease, as well as from the nasopharynx of persons who had had no such contacts (and at the same time it was proved absent during winter in areas remote from epidemics of poliomyelitis); (c) from the spinal fluid, in the very early stages of the disease, of persons stricken during epidemics and of monkeys inoculated with the virus; (d) from the brain and spinal cord, after death, of victims of epidemics, and of rhesus monkeys and mice that had been inoculated

with material containing the virus; (e) in significant incidence, from serial dilution cultures of the "bacteria-free" filtrates of highly potent virus.<sup>20</sup> The streptococci isolated from the nasopharynx of persons who had the disease, from the brain and spinal cord of persons who had died of epidemic poliomyelitis and of monkeys that died after inoculation of emulsions and filtrates of the virus, were remarkably alike in appearance, in staining reactions, in virulence, in electrophoretic velocity and in agglutinability. In general, the isolation of streptococci from emulsions and from filtrates of emulsions of brain and spinal cord of monkeys that died of poliomyelitis was accomplished with steadily diminishing frequency on successive transmissions. This was especially true in mice.

The streptococcus was proved absent from the spinal fluid of rhesus monkeys before inoculation of emulsions and filtrates of highly potent virus, and during the asymptomatic period of incubation, but as fever and other symptoms occurred the organism appeared in high incidence and in great numbers on microscopic examination of Gram-safranin-stained films of centrifuged sediment. Cultures in freshly prepared dextrose-brain broth grew pure colonies in many instances as fever, tremors and staccato voice developed in the subjects after inoculation with different virus strains. The organism diminished in the spinal fluid or disappeared during severe paralysis but was observed in stained films of fluid from the edematous, hemorrhagic anterior horns of the spinal cord; it was isolated from the spinal cord and seen in the lesions, especially of the anterior horns, in monkeys killed by anesthesia after severe paralysis had occurred and in monkeys that died of respiratory failure from rapidly progressing paralysis.

In order to rule out the possibility of chance occurrence of unrelated streptococci or so-called secondary invaders in spinal fluid, the filtrate of the highly potent MV. strain of poliomyelitis virus, which had been transmitted through many monkeys over a period of years, was injected intracerebrally into fourteen monkeys immediately after spinal tap. Cultures of the filtrate of the virus in dextrose-brain broth yielded a pure growth of the streptococcus, whereas culture in dextrose broth and on blood-agar proved sterile. Microscopically examined, the sediment of the spinal fluid of all fourteen monkeys was seen to be free of cells and streptococci, and cultures in dextrose-brain broth produced no growth from spinal fluid extracted before inoculation or from that extracted 48 hours later when symptoms were absent and the temperature of all the animals was normal. At 96 hours, when fever, tremors and staccato voice (but not paralysis) had developed, the streptococcus and lymphocytes and polymorphonuclear leukocytes were readily found in the stained sediment, and pure growth of the streptococcus was isolated in dextrose-brain broth culture from each of the monkeys, while aerobic cultures on blood-agar remained sterile. Two days later, after severe paralysis had developed, the streptococcus was seen

microscopically in specimens from nine of the monkeys, and cultures from but four revealed streptococci. On the eighth day, streptococci were microscopically apparent in two monkeys, and cultures from all remained sterile. The streptococcus was isolated, in dextrose-brain broth, from the spinal cord of each monkey that died from rapidly progressing paralysis. All strains isolated from the spinal fluid were agglutinated specifically by the poliomyelitis antistreptococcus serum, and the distribution curve of cataphoretic velocity was bimodally neurotropic.

Gram-staining pleomorphic diplococci, sometimes in short chains, were found consistently in the lesions of the spinal cord, medulla and brain of persons who had died of epidemic poliomyelitis and of monkeys and mice that died or were killed by anesthesia during the acute stage of poliomyelitis after inoculation with either emulsions or filtrates of the virus; but on investigation of points remote from these lesions the diplococci were proved to be absent.<sup>20</sup>

A distinct tendency to elective localization had been noted in certain streptococci: The streptococcus isolated in studies of epidemic and experimentally induced poliomyelitis tended to localize in the brain and spinal cord and to produce flaccid paralysis, while the streptococcus isolated in studies of arthritis tended to localize in joints and to produce arthritis. In the hope of determining a cause for this phenomenon, large numbers of streptococci of these types were killed by heat and injected intracerebrally in parallel manner into rhesus monkeys and rabbits. The results were remarkable. The streptococcus of poliomyelitis remained in the cerebrospinal fluid and spinal cord, producing great weakness or flaccid paralysis, but no lesions were produced in muscles or joints, nor was the streptococcus demonstrable in the knee joint fluid. The streptococcus of arthritis disappeared promptly from the cerebrospinal fluid and appeared in large numbers in the knee joint fluid while pain and stiffness became evident and lesions of muscles and joints developed. The cause of these examples of specificity or tropism in the dead streptococci is considered similar to or identical with that involved in the well-recognized specific pharmacological action of drugs, chemicals and bacterial toxins.

Of the monkeys subjected to the previous experiment, all were sacrificed for postmortem examination except four that had received the dead streptococci of poliomyelitis and two that had received the dead streptococci of arthritis. These remaining animals were inoculated intranasally with highly potent poliomyelitis virus ten days after the previous intracerebral inoculation. The four monkeys that had received the dead streptococci of poliomyelitis remained well, while typical poliomyelitis developed in the two that had received the dead streptococci of arthritis.

The importance of the streptococcus in poliomyelitis was indicated further in the course of experiments with many different virus strains which had been preserved for periods ranging from several months to six years, at 10° C. in 50 per cent

glycerin, in specimens of brain and spinal cord of monkeys that had died of experimentally induced poliomyelitis. Emulsions of these virus strains were injected intracerebrally into a total of 298 monkeys and were also cultured in dextrose-brain broth. Emulsions which yielded pure growths of streptococcus in culture caused a much higher incidence of typical poliomyelitis in the monkeys than those emulsions which on culture yielded no streptococci.<sup>14</sup>

## II. Serologic and Antigenic Specificity of the Streptococcus and Diagnostic Cutaneous and Precipitation Reactions

In addition to having distinctive distribution curves of cataphoretic velocity and characteristic localizing and disease-producing properties, the streptococcus isolated from and noted in the lesions of poliomyelitis was found to be specific in its serological reaction. It was agglutinated specifically in high titer by antiserum produced in the horse and differentially by serum obtained from convalescent subjects.<sup>18, 20</sup>

The presence of specific streptococcal antigen was demonstrated consistently by the precipitation reaction at the interface between the poliomyelitis antistreptococcus serum and extracts, in sodium chloride solution, of nasopharyngeal swabbings of persons who had poliomyelitis, of persons who had had contact with poliomyelitis patients, and of persons who had had no such contacts but were in the area during epidemics in the summer. The presence of the antigen could not be demonstrated by identical test in winter in places remote from epidemics, except in the serum of persons and monkeys in the active stage of poliomyelitis.<sup>20, 21</sup>

Solutions were made of the euglobin fraction of the serum of horses that had been immunized with the streptococcus<sup>20, 21, 22</sup> and with the heat-produced antibody prepared in vitro from the streptococcus. These solutions were used to test well persons in areas of poliomyelitis epidemics, both those who had and those who had not had contact with persons who had the disease. The presence of specific streptococcal antigen in the skin or blood of these well persons was demonstrated, and corresponding streptococcal infection in throat, intestinal tract or elsewhere was thereby indicated. Again, the application of the test in winter in places remote from epidemic areas demonstrated the absence of infection with the streptococcus.<sup>23, 24, 25</sup> Conversely, the soluble antigen of the heat-killed streptococcus, similarly used, demonstrated the presence of the streptococcal antibody in the skin or blood of persons with poliomyelitis and of well persons in areas of epidemics.<sup>20, 21, 22</sup>

Since these tests—with the thermal antibody for the antigen and with the antigen for the antibody—were found to be invariably harmless and non-sensitizing, and since they yielded such precise information, they were applied, in an etiologic and epidemiologic study, to determine the presence of the specific streptococcus in a total of 432 patients with poliomyelitis and a larger number of well persons in

epidemic areas in summer and, in winter, in places remote from epidemic areas. The results were illuminating. The intensity of reaction indicating specific streptococcal antigen was directly proportional to the degree of paralysis in patients with the disease; the reaction was significantly greater in well persons that had not previously been exposed to poliomyelitis than in persons previously exposed, and in males, the sex more susceptible to poliomyelitis, than in females. In striking contrast, the reaction indicating the presence of antibody was greatest in persons with slighter paralysis or none, least in persons severely paralyzed, greater in females than in males, and greater in persons previously exposed to poliomyelitis than in persons not previously exposed. The intensity of reaction indicating the presence of streptococcal antigen in well persons during epidemics, both in those who had had contact with diseased persons and in those who had not, was roughly proportional to age and somewhat greater in males. In well persons, the test for antibody produced a somewhat greater reaction in females than in males and uniformly a greater reaction than was produced in persons severely paralyzed by the disease. Evidence was obtained in these studies which indicates that immunity to poliomyelitis in proportion to age, and immunity following mild cases or following exposure to epidemics in temperate climates in summer, is due to a long-lasting streptococcal antibody response that is accelerated on subsequent exposure to the organism, especially in summer.

A close parallel was noted among three phenomena: (1) The incidence and degree of reaction indicating streptococcal antigen following intradermal injection of antibody; (2) the agglutination titer of the serum during convalescence; and (3) the viral-neutralizing antibody titer of the serum in convalescence proportional with the severity of the illness, as reported by Jensen.<sup>3</sup> Moreover, all these reactions were observed to occur in inverse proportion to the degree of paralysis in the subject.

Two other tests were made, with notable results, on monkeys inoculated with filtrates of highly potent virus. Daily intradermal injection of saline solution of the euglobin fraction of poliomyelitis antistreptococcal serum caused immediate erythema and edema of the skin. A precipitate occurred in 24 hours at the interface between clear unconcentrated antistreptococcal serum and the serum of the monkeys obtained daily. Neither test produced results before the monkeys were inoculated or during the period of incubation; the results described were observed on the first day of symptoms and throughout twelve to eighteen days, and could no longer be produced after recovery.<sup>20</sup>

The degree of cutaneous erythema that occurred eighteen to 24 hours after intradermal injection of suspensions of the heat-killed streptococcus was used as a gauge of the susceptibility of humans to poliomyelitis. Little or no erythema was produced in persons who had recovered from poliomyelitis either a short or a long time before. Among persons who had not had the disease, in general the reaction was

less in older than in younger subjects. Patients recovering from the disease had successively less pronounced reaction as recovery progressed. Moreover, when well students at a college where an epidemic of poliomyelitis occurred were tested, each a number of times, the degree of reaction diminished sharply during the epidemic and for six weeks thereafter; there was no change in reaction to control injection of heat-killed streptococci isolated in studies of arthritis, and no reduction in reaction to the poliomyelitis streptococcal suspension in students tested as controls at a neighboring college where poliomyelitis had not occurred.<sup>20</sup>

### III. Experimental Production of the Poliomyelitis Virus From Neurotropic Streptococci

Attempts to reproduce the typical clinical and pathologic features of poliomyelitis including the period of incubation by means of the associated streptococcus resulted in failure, as did attempts to produce the "virus" in vitro and in vivo with various cultures of the streptococcus, until a medium was used which did not become acid from growth of streptococci. This medium consisted of "infantile" tissue—that of 19-day hatching chicken eggs. The eggs, including the shells, were reduced to a mash which was mixed with seven parts of distilled water, infused at 10° C. for 24 hours, placed in tall containers, sterilized in an autoclave and sealed with a film of liquid petrolatum. This medium was found very favorable for the isolation, rapid growth and maintenance of viability of the streptococcus. As the cultures aged, smaller and even submicroscopic filtrable forms developed.

After inoculation of mice and monkeys with the older cultures and the filtrates from them, symptoms and lesions of encephalomyelitis developed. On serial brain-to-brain transmission in mice of a strain highly susceptible to encephalitis virus and resistant to poliomyelitis virus, the virus became extremely potent but remained encephalitic. After numerous transmissions, brain emulsions were prepared from the latest mice in the series and injected into rhesus monkeys of a strain highly resistant to encephalitis virus and highly susceptible to poliomyelitis virus. Encephalopoliomyelitis resulted from this inoculation and also from inoculation with the aged chick-embryo culture and with filtrates of cultures of the streptococcus isolated directly from poliomyelitis virus; but on serial brain-to-brain transmission in the monkeys, the virus became poliomyelitic.<sup>29, 30, 31</sup>

The clinical and pathologic features of the poliomyelitis caused by the experimentally developed virus were indistinguishable from those caused by the natural virus. Monkeys that recovered from poliomyelitis produced with the experimental virus were found to be immune to natural virus, and vice versa; the serum of monkeys convalescent from natural virus neutralized the experimental virus and vice versa. When animals were inoculated with emulsions and filtrates of emulsions of spinal cord of monkeys that had received the experimental virus, the streptococcus appeared in the spinal fluid and

in the lesions in the anterior horns of the spinal cord in the same manner as in infection with the "natural" virus, and could be isolated from spinal cord only by the special methods used for isolation of the natural virus.

Diplococci, varying greatly in size, sometimes grouped in short chains and circles, were seen with the electron microscope at 12,000 diameters in filtrates of both natural and experimentally produced virus without staining or shadowing; after special staining the larger forms were seen with the light microscope at 1300 diameters. It was estimated from the number of particles, ovoid in shape, some diploid and some in short chain formation, that 400 million were present per milliliter of the Berkefeld N filtrates examined. In films of dextrose brain-broth cultures of the streptococcus isolated from poliomyelitis virus, prepared with Gram-saffranin stain and fixed with formalin, extremely minute diplococci, both free and in radial orientation, were seen, but only with the electron microscope.<sup>32</sup> The diplococcal chain formations were more conspicuous in a second study with the electron microscope of filtered highly potent virus (unpublished data).<sup>\*</sup> Proof now appears complete that the virus of poliomyelitis is particulate, spherical or elongated, and grouped in diploid or in short filamentous chain formation, as evidenced in electron micrographs by Loring, Schwerdt and Marton<sup>5</sup> and, most convincingly, by Reagan, Schenck and Brueckner.<sup>11</sup> The observations of these investigators further strongly suggest that the virus and the streptococcus are related. The recent reports by others of electron micrographs of particles of various sizes, spherical or ovoid and in diploid or short chain formation, in the viruses of herpes zoster, mumps, encephalitis and influenza—the treatment of which remains an unsolved problem—may be taken to indicate that the viruses of these diseases may likewise be related to the respective specific streptococci which the author has isolated by special methods in these diseases and with which the lesions characteristic of the diseases have been reproduced or closely simulated.

#### IV. Protection of Monkeys Against Virus and the Serum Treatment of Epidemic Poliomyelitis

Poliomyelitis, occurring in epidemics or experimentally produced in animals, has been treated in a large number of cases with the antistreptococcal serum prepared in horses. A total of 282 rhesus monkeys were actively immunized with the serum, subjected to tests which gave presumptive evidence that the virus would be neutralized, and then inoculated with poliomyelitis virus. Of these monkeys 103 or 36 per cent died of the disease. In sharp contrast, of 293 normal control monkeys also inoculated, 240 or 82 per cent died of the disease.<sup>20</sup> The serum was made available for treatment of patients with poliomyelitis by Eli Lilly and Company and was distributed to physicians working independently. Of

710 patients treated with the serum, 60 or 8 per cent died. During the period of this trial, 2,737 other cases (in which the serum was not used) were reported as occurring in different epidemics under similar conditions, and 583 or 21 per cent of the patients died.

Cases in which the author and co-workers used the antistreptococcal serum were divided into three groups according to the length of time that had elapsed from onset of disease to beginning of treatment. (The diagnosis was established by studies of spinal fluid in all cases in which paralysis had not already occurred and in nearly all other cases.) The results were as follows: Of 487 patients who received the first injection of serum before onset of paralysis, 16 or 3 per cent died, and of 460 of the remainder who were adequately followed, only 9 or 2 per cent had severe residual paralysis. Of 696 patients who had slight or moderate paralysis at the time of the first serum treatment, 42 or 6 per cent died, and of 621 of the rest of them who were followed, 20 or 3 per cent had severe residual paralysis. Of 771 who were severely paralyzed before the first serum treatment, 134 or 17 per cent died and of 635 of the remaining patients who were followed, 150 or 24 per cent had severe residual paralysis. Of the total number of patients in these three groups, 10 per cent died and 10 per cent had severe residual paralysis. Of the control patients who did not receive the serum, 25 per cent died and 33 per cent had severe residual paralysis. Equally favorable results were independently obtained in 1917 by Nuzum and Willy<sup>9</sup> in the treatment of epidemic poliomyelitis with antistreptococcal serum prepared in the horse.

The antistreptococcal serum is not now available; it deteriorates rapidly in storage, and outbreaks of the disease are seasonal. However, studies on the production in vitro of antibody from streptococci and other bacteria<sup>24, 25</sup> have resulted in the development of non-sensitizing and more stable solutions of heat-treated antibody from streptococci isolated in studies of a number of diseases including epidemic poliomyelitis. In such solutions the antibody prepared from the streptococcus of poliomyelitis has neutralized with significant frequency a virus potent in the mouse;<sup>26</sup> it specifically agglutinates the streptococcus in extremely high titer and notably accelerates the destruction of the streptococcus on intraperitoneal injection into mice.<sup>24</sup> Subcutaneous or intramuscular injection of this antibody in therapeutic amounts in persons with poliomyelitis causes abrupt diminution of antigen and increase in antibody (as determined by reaction to intradermal injections of antibody and antigen);<sup>20</sup> the treatment appears to prevent paralysis and otherwise affect favorably the clinical course of the disease<sup>26, 23, 10, 12</sup> and, prophylactically used, to prevent transmission within family groups.

#### CONCLUSIONS

On the basis of the facts reviewed in this presentation, it is concluded that epidemic poliomyelitis is due to infection by a specific streptococcus

<sup>\*</sup> The author is indebted to Radio Corporation of America, Camden, N. J., and General Electric Company, Schenectady, N. Y., for assistance and for the use of the electron microscopes.

which in the "virus" phase becomes minute and filtrable and perhaps thus penetrates the blood-brain barrier to invade the central nervous system from the primary site of infection in the nasopharynx or the intestinal tract. During or after the filtrable phase, the organism reverts to streptococcal size in which it is cultivable, toxicogenic and causative of lesions, fever, tremors and paralysis. During the subsequent course of the disease both the viral and the coccal forms propagate in parallel in varying proportions and are virtually inseparable even in filtrates of highly potent "virus."

Immunity following the course of the disease would seem to be due mainly to the effects of the large, cultivable form of the organism in its toxicogenic-antigenic phase. With serum containing the organism in this phase, monkeys have been immunized against the effects of the virus; antistreptococcal sera and antibody have been prepared with the streptococcus, although these preparations could not be made with the minute, filtrable form.

That the large cultivable streptococcus is also the form of the organism in primary infection is evidenced by the facts that (1) the "viral" form cannot propagate except in or on the susceptible living cells of a susceptible host, as has been shown in studies; (2) the virus has been produced experimentally from neurotropic streptococci; and (3) the streptococcal flora indigenous in man and in animals tend to become neurotropic in summer in temperate climates.

The use in adequate dosage of the non-toxic, non-sensitizing heat-produced antibody prepared from the specific type of streptococcus whose specificity was maintained is strongly indicated for the treatment of epidemic poliomyelitis. This material can readily be prepared, by methods previously described, from the streptococcus as isolated from the nasopharynx of persons who have the disease during epidemics.

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## Surgical Decompression of the Bowel in Peritonitis

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### SUMMARY

*In some circumstances peritoneal infection causes distention and crowding of the bowel to such an extent that the effect is that of intestinal obstruction and it is impossible to introduce a tube far enough by physiologic routes to bring about deflation. The pressure upon the diaphragm then may cause pain in breathing, with the result that the patient does not fully expand the lungs and atelectasis develops in the lower lobes. In such circumstances surgical intervention to relieve the pressure in the bowel may be indicated.*

*An ordinary urethral catheter introduced through an incision in the intestine cannot be extended far enough to relieve pressure in more than a few loops.*

*A method of using a Foley catheter and of advancing it for greater distances inside the bowel was used in five cases with good results and without complications.*

**T**REATMENT of all types of peritoneal infection rests in the main with conservative management—the use of antibiotic and sulfa drugs and the judicious application of gastric and intestinal suction by means of any of the many adequate tubes available. There are, however, certain exceptional circumstances in which surgical treatment of the pathologic processes associated with peritoneal infection may be required—as in cases of ruptured viscus or cases in which the abdomen is opened without foreknowledge of the presence of extensive peritonitis.

Extensive peritonitis causes the bowel to lose normal tone and motility, to become distended with swallowed air, and to be pressed into layered folds so that the effect is that of intestinal obstruction. The abdomen becomes tense as it is distended and the mounting intraperitoneal pressure causes elevation of the diaphragm and limitation of respiratory excursion. A bed-ridden patient, in pain with each inspiration, so greatly reduces the tidal air volume and takes so much care to avoid coughing that, secondary to accumulated secretions in the bronchi and decreased thoracic volume, atelectasis develops in the lower lobes.

Intestinal deflation is the one measure that can considerably relieve this situation. Unfortunately, in too many cases the temporarily paralyzed bowel cannot welcome to its major portion an intestinal

intubation tube, nor can it deliver to the stomach by reverse peristalsis its contents of liquid and gas.

When the abdomen is open, the bowel can be emptied by means of enterostomy, suction being connected to the catheter according to the method of Wangenstein. However, when an ordinary urethral catheter is used, it is difficult to empty more than a few loops of bowel; and if the urethral catheter is brought out through a stab wound, it all too often slips out during the early postoperative hours.

### PROCEDURE

To solve this problem the authors used the following procedure in five cases:

After placement of a purse-string suture, the bowel was opened between Allis forceps, a No. 18 Foley catheter with a 5 cc. bag was introduced, and the suction was connected with the catheter. The bag was then filled with 5 cc. of sterile water. The water bag was pressed along inside the bowel (see Figure 1), much as a bodkin is used to thread a drawstring through the hem of a blouse, until several feet of intestine was accordion-folded on the catheter and as much of the bowel as possible was emptied. The butt end of the catheter was then brought out through a stab incision in the flank. Two Foley catheters were used in each case. By this means the entire small intestine was deflated and was kept deflated during the postoperative period.

After operation, the catheters were attached to rubber tubes leading to receptacles. (Postoperatively, suction is unnecessary and undesirable.) After they had been in use eight hours they were irrigated to make sure they were not clogged. The inflated bag prevented the catheter's slipping out until the water was released.

In the cases in which this method was used, the upper catheter was removed on the sixth day and the lower one on the eighth (but of course the period should be adjusted to the progress of the patient). The enterostomy wounds closed spontaneously within a few days, but, for protection meanwhile, aluminum paste was applied around the opening, and the dressings were changed frequently.

The patients were permitted to walk on the first postoperative day, with the catheters clamped during the periods of ambulation.

At the time this report was written this method had been used in three cases of peritonitis secondary to ruptured appendix, in one case secondary to rupture at the site of carcinoma of the colon, and in one case of peritonitis secondary to rupture at the site of duodenal ulcer. All patients recovered without complications.

450 Sutter Street.

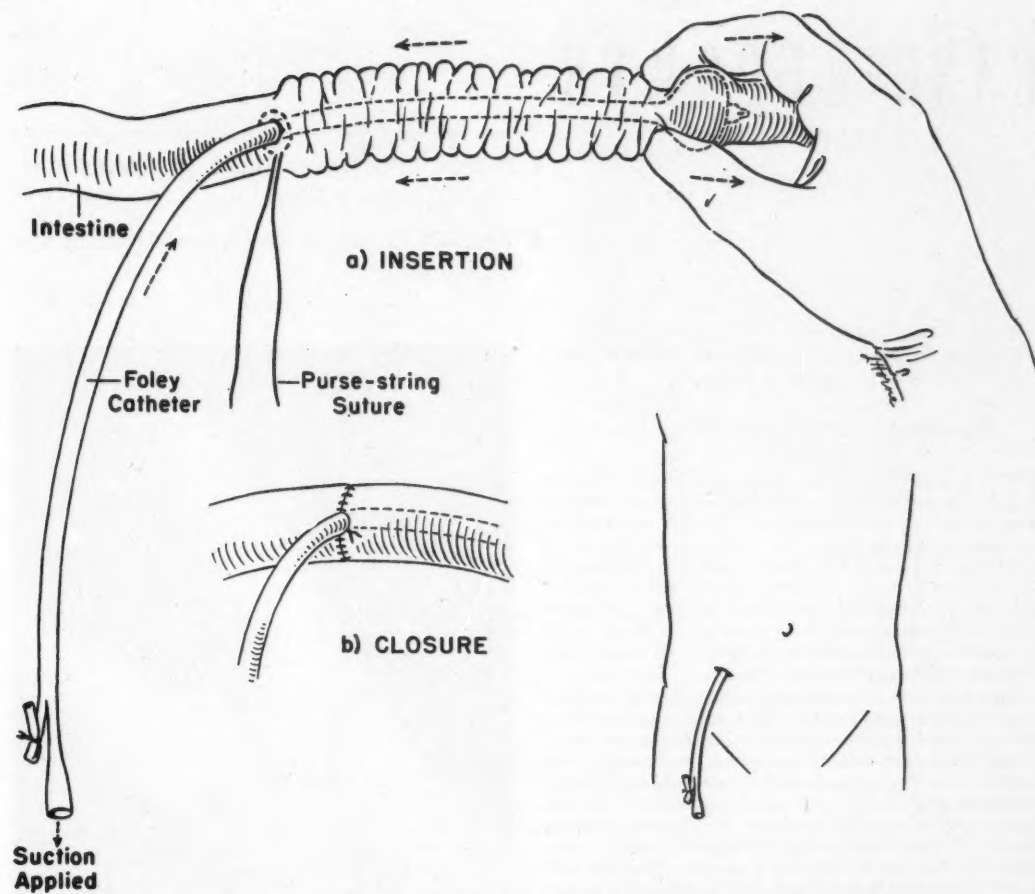


Figure 1.—Method of decompressing the bowel by surgical introduction of a Foley catheter.

# CASE REPORTS

## ◀ Benign Lymphoreticulosis of Inoculation ("Cat-Scratch Fever")

## ◀ Tetanus Treated with Chloral Hydrate and Myanesin

### Benign Lymphoreticulosis of Inoculation ("Cat-Scratch Fever")

TRACY D. CUTTLE, Commander, MC, U. S. Navy,  
*Oakland*

**C**AT-SCRATCH fever is a term applied by Lee Foshay of Cincinnati, Ohio, to a disease entity resulting from the scratch of a domestic cat. The first report of this disease published in English was by Greer and Keefer<sup>2</sup> in April 1951. Several reports have appeared in French medical periodicals, the first by Debre<sup>1</sup> and co-workers in January 1950. The disease is characterized by fever, lymphadenopathy, and general malaise; and, in certain cases, an exanthematous eruption resembling that of erythema multiforme or erythema nodosum occurs.

The cause is unknown, although the condition is invariably associated with the scratch of or association with a domestic cat. It resembles tularemia but is a much milder disease. The most striking feature of the disease is the extraordinary lymphadenopathy. Clinical manifestations and laboratory data are not peculiarly characteristic. The etiological agent is, in all probability, a virus that is present in the pus obtained from buboes. A specific antigen is prepared from the pus by the Frei procedure. When injected intradermally, it causes a reaction at the site if the subject has the disease. Antigen prepared from a bubo of a patient with cat-scratch fever was supplied to the author by Foshay. The material was heated to 60° C. for two hours on one day and for one hour the next day. It was then diluted with an equal portion of sterile saline solution. The skin test is made by intradermal injection of 0.1 milliliter of the antigen. A positive reaction consists of the appearance of redness, swelling, and itching at the site of injection at 24 hours, with increase in the size of the involved area at 48 hours. The reaction persists for several days.

It is the purpose of this communication to report a typical case of cat-scratch fever in the San Francisco Bay area. So far as can be determined, there have been no previous reports of this condition in this area, and only one previous case has been reported in English.\*

#### REPORT OF A CASE

A white man 34 years of age was admitted to hospital on June 28, 1951, because of an epitrochlear mass on the left side. The patient was well until approximately June 1, 1951,

The opinions and assertions herein are those of the writers and are not to be construed as official or reflecting the views of the Navy Department or of the Naval Service at large.

\*After this report was submitted for publication, W. B. Daniels and F. G. MacMurray published a report on a series of 12 patients with the disease (A.M.A. Arch. Int. Med., 88:736, Dec. 1951) and Cat-Scratch Disease was the subject of an editorial in the Journal of the American Medical Association (J.A.M.A., 148:736, Mar. 1, 1952).



Figure 1.—Lesion on the lateral aspect of the middle finger of the left hand, approximately 0.5 cm. in diameter. The lesion was raised, red, indolent, and slightly tender.

when he noted an irritated area on the middle finger of the left hand where he had been scratched by a kitten. The lesion did not heal, and about June 14, he noted a tender mass on the medial aspect of the left elbow. The lesion grew and became more painful. At about the same time, the patient noted small tender masses in the left axilla. A week later a small amount of pus was expressed from the original lesion on the hand. Penicillin had been given by a physician, but without relief, and since June 20 (a week before admittance) the patient had noted fatigue, general malaise, fever up to 99.5° F., and vague abdominal distress.

Upon physical examination it was noted that the lesion on the lateral aspect of the middle finger of the left hand, approximately 0.5 cm. in diameter, was raised, red, indolent, and slightly tender. The surrounding area was indurated (see Figure 1). The left epitrochlear lymph node was 4 cm.

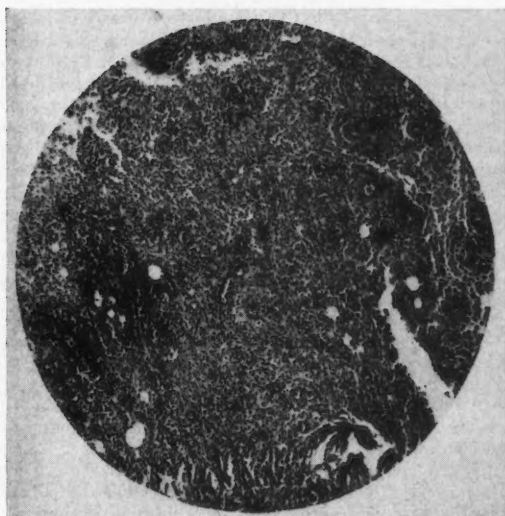


Figure 2.—Loss of normal architecture due to the crowding out of normal follicles by reticuloendothelial hyperplasia.

in diameter. It was firm, tender, freely movable, and the skin over the lesion was inflamed. There were two palpable, tender lymph nodes in the left axilla.

The hemoglobin content of the blood was 14.0 gm. per 100 cc. Erythrocytes numbered 4,800,000 per cu. mm., and leukocytes 8,400—67 per cent neutrophils, 26 per cent lymphocytes, 4 per cent monocytes, and 3 per cent eosinophils. The erythrocyte sedimentation rate was 22 mm. in one hour and the packed cell volume was 47 per cent of the whole blood. No significant abnormalities were noted in the urine. Result of a Kahn test of the blood was normal. A Davidsohn heterophil agglutination test and an agglutination test for tularemia were carried out. Results of both were negative. A roentgenogram of the chest was normal.

The possibility of cat-scratch fever was suggested by a member of the staff who had observed a patient with the disease in Washington, D. C. The antigen was injected and the reaction was strongly positive. At 24 hours an area of swelling, redness, and itching, approximately 3 cm. in diameter, was noted at the site of injection. The area increased in the next 48 hours, then subsided over a period of several days. Three other patients subjected to the test had no reaction to the antigen.

On July 18 the left epitrochlear node was excised. In microscopic examination of the excised node it was observed that the normal structure was almost completely replaced by pronounced hyperplasia of the reticuloendothelial cells (see Figures 2 and 3). There appeared to be a moderate increase in fibrous connective tissue. Plasma cells, histiocytes, lymphocytes, and eosinophils were scattered irregularly throughout the sections. Some of the histiocytes appeared swollen and contained vacuoles. No other abnormalities were noted in stained sections.

The symptoms subsided spontaneously, and the patient was discharged from the hospital on July 20.

The clinical course in this case coincided with previous reports describing cat-scratch fever as a self-limited disease lasting three to eight weeks. Although it is a systemic disease with symptoms of fever and general malaise, the lymphadenopathy is the most striking feature. Although in some reported cases exanthema resembling erythema multiforme and erythema nodosum was observed, in the present case

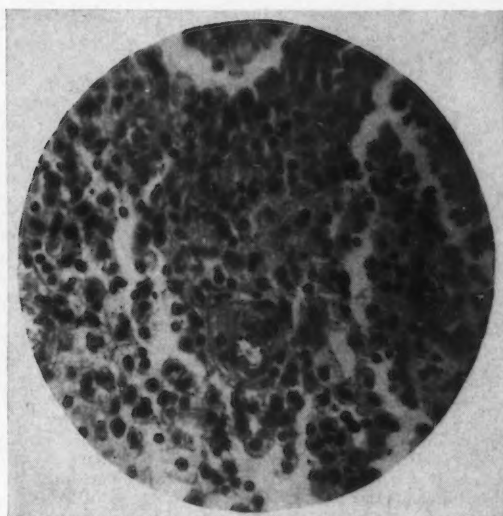


Figure 3.—High-power magnification showing the character of hyperplastic cells.

there were no dermatologic manifestations. Although the symptoms are such that all causes of lymphadenopathy may be considered in differential diagnosis, they particularly resemble those of tularemia. However, cat-scratch fever is a milder disease, and it may readily be distinguished from tularemia on the basis of results of agglutination tests and skin tests with specific antigen. It differs from cat and rat bite fever in etiologic factors; and whereas there is positive reaction to Wassermann and Kahn tests in rat and cat bite fever, in cat-scratch fever the results of these tests are negative. No specific therapy is indicated as the disease is mild and self-limited. Penicillin seems to have no effect on the disease, although aureomycin is reported to be beneficial. A complete description of the pathological changes in lymph nodes at various stages of the disease was reported by Mollaret<sup>3</sup> and co-workers in March 1950. In May 1951 the same investigators reported isolation of the virus of benign lymphoreticulosis of inoculation<sup>4</sup>—an improvement over the colloquial term cat-scratch fever.

In tests upon cats, no reaction to the antigen was noted. Nor was there, in cats, development of complement-fixing antibodies against *Lygranum*.<sup>6</sup> In humans who have the disease, complement-fixing antibodies against *Lygranum* develop as the disease progresses.

#### SUMMARY

A case of cat-scratch fever is presented. This is the first recorded occurrence of the disease in the San Francisco Bay area and the second case reported in English. Approximately 20 cases have been reported in French medical periodicals.

The disease is characterized by a history of scratch by a domestic cat, followed by fever, malaise, and remarkable lymphadenopathy.

Skin manifestations resembling those of erythema multiforme and erythema nodosum have been reported.

The infective agent is a filterable virus which is present in pus from involved lymph nodes. An antigen made of the pus causes specific dermatologic reaction in persons who have the disease.

The pathological changes in the lymph nodes have been presented.

No specific therapy is indicated, although it is suggested that aureomycin may be beneficial.

U. S. Naval Hospital.

#### ACKNOWLEDGMENT

The author is grateful to Captain Joseph L. Zundell, M.C., USN, for his assistance in the preparation of the microphotographs of the lymph nodes and Dr. Lee Foshay for the supply of antigen used in this investigation.

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## Tetanus Treated with Chloral Hydrate and Myanesin

E. HOLZMAN, M.D., Los Angeles

THE use of Myanesin® as an adjunct in the treatment of tetanus arises from its properties as a muscle relaxant. The original work on this drug was done in 1946 by Berger and Bradley,<sup>1,2,3</sup> who noted that muscular relaxation could be obtained without cerebral depression. In higher doses the drug caused analgesia, ataxia, and finally an arousable sleep with paralysis. As the convulsions caused by strychnine were lessened or abated by Myanesin, it was thought the drug acted through reduction of the reflex excitability at the spinal cord level. Convulsions due to Metrazol® were not affected, however, presumably because Metrazol acts through the higher centers.

Used clinically by Stephen and Chandy<sup>4</sup> in 1947, Myanesin was observed to attenuate the tremor of Parkinsonism. This was confirmed by Gammon and Churchill in 1949.<sup>5</sup>

Berger and Schwartz<sup>6</sup> in 1948 reported successful treatment of patients with cerebral palsy of the spastic, athetoid, and choreiform types with Myanesin given by mouth.

The use of the drug in the treatment of tetanus, at least so far as is reported in the English literature, is of recent origin. There are apparently no reports on large series with controls, but results reported in sporadic cases of tetanus indicate the drug is of definite value in controlling convulsions.

The most serious complication in the use of the drug appears to be a tendency to hemolyze erythrocytes, a tendency that is accentuated when it is given intravenously. Also overdoses will cause ataxia, and nystagmus, first horizontal, then vertical.

Various methods of use have been reported. In some cases the drug was used alone, either intravenously<sup>7</sup> or orally,<sup>8</sup> but more commonly some form of sedation was used with it—usually a barbiturate, paraldehyde, Avertin® given rectally, or chloral hydrate. Owing to the variability of the disease and of the treatment, and especially in the absence of long term surveys, the most efficacious means of treatment cannot be determined as yet.

From the Service of Dr. A. G. Bower, Los Angeles County Hospital.

#### REPORT OF A CASE

An eight-year-old boy was admitted to the hospital Aug. 8, 1951, four hours after onset of abdominal pain, inability to open the mouth, and aching in the neck. The patient had had a puncture wound into the dorsum of the left foot from a dirty stick one week previously. A physician was not consulted. The wound was treated at home with soaks and ostensibly healed satisfactorily. The patient had never been immunized against tetanus.

Upon examination, severe trismus, moderately severe nuchal rigidity, abdominal spasm, and moderate ham-string spasm were noted. The reflexes were equal but hyperactive. There was an old abraded puncture wound on the dorsum of the left foot.

The hemoglobin content of the blood was 13.5 gm. per 100 cc., erythrocytes numbered 3.29 million per cu. mm. and leukocytes 10,500 with 88 per cent polymorphonucleocytes. The urine was normal.

A total of 200,000 units of tetanus antitoxin was given, 40,000 units in each buttock, 40,000 in the left thigh, and the remainder injected around the wound locally.

The wound then was widely excised with the patient under general anesthesia. After the operation the patient was given chloral hydrate, 1 gm. every three to six hours.

The following day the condition was unchanged, and the frequency and severity of the contractions appeared not to be controlled by chloral hydrate in the amounts given, even though it was given to a point where the patient remained unresponsive between contractions. Even the slightest stimuli set off moderate contractions.

On the third day Myanesin was given intravenously in doses of 300 mg. each, at first every two to three hours and then every three hours. The frequency of the injections was necessary because, although pronounced muscular relaxation was noted immediately after each, severe contractions occurred approximately an hour later. Chloral hydrate also was given every two to three hours in amounts of 1 gm. to 1.3 gm. as the situation seemed to dictate. During this time the patient was semicomatose, and 5 per cent glucose in water or saline solution was administered by constant intravenous drip.

In order to prevent the severe contractions about an hour after Myanesin was given, administration of the drug by constant intravenous drip was started. The amount infused in a 24-hour period was about 7.5 gm., and, except for a single severe seizure that occurred before a significant amount of Myanesin could be given by this means, the patient did extremely well in that there were many mild contractions but fewer moderately severe spasms and none that were severe. The most dramatic aspect at this point was the relatively high threshold of reactivity to contractions; stimuli that formerly would have caused a major seizure caused only mild contractions or none at all.

On the seventh day after admittance to hospital, the patient was febrile and had severe generalized urticaria and a moderate amount of edema. Penicillin (which the patient had been receiving prophylactically) and Myanesin were discontinued as possible allergens. To relieve the urticaria which was evidently causing the patient much distress, Benadryl® was given intravenously but without effect.

The following day the edema was much worse and it was thought to be caused by serum reaction. More Benadryl was given, and then 0.5 gm. of procaine intravenously, but to no avail. As the edema was so severe and the patient restless, 10 mg. of adrenocorticotrophic hormone was given intravenously over a 12-hour period. There was no appreciable effect; the same dose was repeated. No change was noted in the next two days except perhaps an increase in edema and more frequent contractions.

The following day a Levine tube was inserted in order that Myanesin might be given orally, and also to facilitate feeding. Although this was the ninth day of the disease, the first attempt to place the Levine tube, after 1.3 gm. of chloral hydrate had been given as sedation, caused several moderately severe contractions. Then 300 mg. of Myanesin was given intravenously and the tube was inserted.

Next day, Aug. 19, mild abdominal distention was present, and on two occasions the patient had severe contractions, with laryngospasm, which were relieved by giving a barbiturate intravenously.

On Aug. 20 the patient was in extremely critical condition, primarily because the edema had progressed to involve the neck and there were frequent moderately severe contractions with laryngospasm. He was also very dyspneic and bordering on cyanosis. Breathing was almost entirely diaphragmatic with very poor intercostal excursion. Because of the apparent laryngeal obstruction due to edema, tracheotomy was done.

Although the patient then seemed to improve slightly, respirations were no better and positive pressure to assist breathing through the tracheotomy tube was applied for about 15 minutes, and it was thought there was a little further improvement. To assure steadier respiration, the patient was removed to a Drinker-Collins respirator. In the short period (two to five minutes) necessary to effect the transfer, even with positive pressure breathing, the patient became apneic and the pulse was not palpable for approximately 30 to 60 seconds. The color of the patient improved dramatically and immediately after he was placed in the respirator.

For the next four days abdominal distention and dysuria were distressing and seemed to cause a greater frequency of contractions. The patient was febrile and in an x-ray film of the chest paramediastinal density consistent with pneumonia was noted. The urine was normal. Administration of penicillin intramuscularly and of chloramphenicol by Levine tube was started Aug. 22. On Aug. 24 the patient was taken out of the respirator and the breathing then was noted to be labored and with poor intercostal excursion. After 30 minutes out of the respirator the patient again had a major contraction and he was returned to the respirator.

There was gradual improvement for the next four days, but on the fifth day a generalized papular rash, interpreted as a sensitivity reaction, developed and the Myanesin was discontinued. Chloral hydrate was given as usual.

On Aug. 29, when the patient was again removed from the respirator, dyspnea was still present. Edema was negligible.

By Sept. 4, the breathing had so improved that the respirator no longer was necessary, and recovery then was

comparatively uneventful except for an occasional minor spasm, and a foot drop that had developed apparently as a result of the constant spasm of the disease.

#### DISCUSSION

A striking feature in this case was that Myanesin could stop a severe tetanic contraction and yet not cause respiratory depression such as occurs with intravenous use of a barbiturate.

For the first two and a half days, Myanesin was given in interrupted intravenous injections and all major contractions occurred about an hour after the injections. When Myanesin was given by constant intravenous drip the number and especially the severity of the contractions diminished.

When Myanesin was discontinued, even though the chloral hydrate was continued in therapeutic dosage, contractions intensified. Unfortunately, Myanesin was used in comparatively small dosages and there was no striking improvement.

That the present case was a severe one is indicated by the fact that on the eighteenth day of the disease the patient had a major contraction apparently secondary to the partial asphyxia from being left out of the respirator too long.

Also of interest, although not related to the tetanus, was the fact that ACTH did not lessen the serum sickness. Unfortunately, eosinophil studies to determine if the dose was sufficient were not carried out.

While it is stated in the literature that it is possible to treat the disease with Myanesin given by Levine tube, this method was not successful in the present case until the disease had subsided considerably.

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## EDITORIAL

### 1952 Annual Session

What has been described by many members as one of the best Annual Sessions in C.M.A. history was concluded in Los Angeles on April 30. In all departments it operated smoothly and with a greater degree of leisure than has characterized earlier meetings.

Registration was over 4,000, more than it had ever been before; but so well organized was the registration desk that there was none of the tedium or of the confusion that usually attends the business of registering at a convention, large or small. Indeed, one registrant was heard to say that, save for the fact that he was pleasantly greeted at the desk, he felt "like an automobile being assembled."

In the scientific department, the session presented a program of excellent papers in all sections. Those who attended had opportunity to hear interesting presentations by the Association's guest speakers: Charles L. Brown, M.D., dean, Hahnemann Medical College, Philadelphia; William S. McCann, M.D., Charles A. Dewey professor of medicine, University of Rochester School of Medicine, Rochester, N. Y.; Lester R. Dragstedt, M.D., professor of surgery, University of Chicago School of Medicine; Haven Emerson, M.D., professor emeritus, Public Health Administration, Columbia University College of Physicians and Surgeons, past president, American Public Health Association, New York; and Eugene P. Pendergrass, M.D., professor of radiology, University of Pennsylvania School of Medicine, Philadelphia. For the most part, the available meeting rooms were adequate to handle those present, and interest in all subjects was high. The scientific exhibits were well attended and came in for high praise. Medical motion pictures were shown daily on a day-long schedule, covering a multitude of subjects and drawing large and enthusiastic audiences. The director of this section of the program again came in for the plaudits of his fellows for the excellence of the display.

Exceptionally able newspapermen who were assigned by newspapers in Los Angeles and San Fran-

cisco to cover the meeting expressed pleasure that the Association had helped make their task easier.

On the social side, the Woman's Auxiliary put on an unusually fine program and, as usual, attracted many members of the Association to its reception. Its business meetings were very well attended and commanded a great deal of interest.

The House of Delegates, this year operating with two reference committees to consider new business, put in its usual long hours and came up with its usual sound decisions. Great interest was shown in the report of the C.P.S. Study Committee. Made in the form of a progress report, it brought to the fore some subjects on which definite recommendations were possible now and discussed others which will require further study. The House voted to continue this committee in existence, both for the purpose of carrying on further studies and as a means of retaining the valuable knowledge which the committee members have gained in the past nine months.

Considerable discussion took place in the House of Delegates over the interim sessions of the House. When the votes were counted, the Interim Session was retained and tentative arrangements have been made to hold the next interim meeting in San Francisco in early December.

In the elections, Dr. John W. Green of Vallejo was chosen as President-Elect. Dr. Donald A. Charnock was reelected as Speaker of the House and Dr. Wilbur Bailey was picked as Vice-Speaker. Drs. Warren L. Bostick of Marin County, Omer W. Wheeler of Riverside, Arthur A. Kirchner of Los Angeles and Hollis L. Carey of Butte were named as new members of the Council, succeeding Drs. Green, Bailey, Thompson and the late John Ball. Other incumbent Councilors were reelected.

A full transcript of the House of Delegates meetings will appear in next month's issue. It is highly recommended reading for the many members who cannot attend the Annual Session but wish to keep up with the affairs of the California Medical Association.

# CALIFORNIA MEDICAL ASSOCIATION

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## NOTICES AND REPORTS

### The New President-Elect

John W. Green of Vallejo, who for 38 years has been almost continuously an official in organized medicine at local, state and national levels—with time out for military service in the first world war—was elected President-Elect of the California Medical Association at the 1952 Annual Session in Los Angeles in April.

The record of Dr. Green's official posts indicates that almost from the time he became a full-fledged physician his ability and usefulness in medical organizations was recognized. Graduated from Rush Medical College in 1908, he interned at Mercy Hospital, Iron River, Mich., and then:

1914, secretary of Black Hills, South Dakota, District Medical Society.

1915-1916, secretary Koble County, Indiana, Medical Society.

1917-1921, served in U. S. Navy. His last assignment was as ship's surgeon on vessels returning troops from France, and he was discharged at Mare Island Navy Yard, Vallejo. There he reentered private practice, specializing in diseases of the eye, ear, nose and throat, and became a member of the Solano County Medical Society, which he served six years as secretary, two years as president.

For eleven years Dr. Green was a member of the House of Delegates of the California Medical Association and for the past twelve years has been a member of the C.M.A. Council representing the Tenth Councilor District. He is also a delegate from California to the House of Delegates of the American Medical Association.

Like many a busy man, the new President-Elect has a bow with many strings. That he has found time for other than the organizational aspects of medicine is indicated in the fact that he is a past-president of the Vallejo Academy of Medicine and of the Northern California Eye, Ear, Nose and Throat Society. And there is hardly a civic organization in his own community that he has not served or does not now serve in one official capacity or another. Nor is he a man unacquainted with budgets and balance sheets and income accounts: He was the first president of the Vallejo Finance and Thrift



JOHN W. GREEN

Company and is now a director of the Vallejo branch of the Bank of America.

Although the record speaks well, perhaps a better estimate is given in the words of his long-time friend, Dr. Dwight H. Murray: "He will never falter in continuing to do what he believes to be the best for medicine and the welfare of the people of California."

Dr. Green, a physician's son, was born in 1886 on Independence Day.

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## In Memoriam

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DAVIS, ANDREW S. Died in San Leandro, April 1, 1952, aged 51, of carcinoma, generalized. Graduate of the Medical College of Virginia, Richmond, 1926. Licensed in California in 1927. Dr. Davis was a member of the Alameda-Contra Costa Medical Association, the California Medical Association, and a Fellow of the American Medical Association.



DUNCAN, JOHN A. Died in Marysville, March 30, 1952, aged 64, of coronary artery disease. Graduate of Stanford University School of Medicine, Stanford University-San Francisco, 1918. Licensed in California in 1918. Dr. Duncan was a member of the Yuba-Sutter-Colusa County Medical Society, the California Medical Association, and a Fellow of the American Medical Association.



FISHER, RAY H. Died in Oakland, April 25, 1952, aged 69, of coronary artery disease. Graduate of the University of Colorado School of Medicine, Denver, 1909. Licensed in California in 1927. Dr. Fisher was a member of the Alameda-Contra Costa Medical Association, the California Medical Association, and a Fellow of the American Medical Association.



HAMER, CLEMEN. Died in Glendale, April 2, 1952, aged 68, of pneumonia. Graduate of the College of Medical Evangelists, Loma Linda-Los Angeles, 1924. Licensed in California in 1924. Dr. Hamer was a member of the Los Angeles County Medical Association, the California Medical Association, and a Fellow of the American Medical Association.



HANSON, OSCAR J. Died in Redding, March 7, 1952, aged 46, of coronary thrombosis. Graduate of the College of Medical Evangelists, Loma Linda-Los Angeles, 1930. Licensed in California in 1930. Dr. Hansen was a member of the Shasta County Medical Society, the California Medical Association, and a Fellow of the American Medical Association.



HANZE, HENRY G. Died April 1, 1952, aged 51. Graduate of the College of Medical Evangelists, Loma Linda-Los Angeles, 1925. Licensed in California in 1925. Dr. Hanze was a member of the Santa Barbara County Medical Society, the California Medical Association, and a Fellow of the American Medical Association.

HATTEROTH, WILLIAM H. C. Died in Oakland, April 18, 1952, aged 72. Graduate of the Cooper Medical College, San Francisco, 1903. Licensed in California in 1915. Dr. Hatteroth was a retired member of the Alameda-Contra Costa Medical Association, and the California Medical Association.



MARCUSSEN, ROBERT M. Died in Menlo Park, April 13, 1952, aged 34. Graduate of Cornell University Medical College, New York, 1943. Licensed in California in 1949. Dr. Marcussen was a member of the San Mateo County Medical Society, the California Medical Association, and a Fellow of the American Medical Association.



MCCULLOUGH, JAMES M. Died in Oakland, April 5, 1952, aged 56, of acute coronary occlusion. Graduate of Oakland College of Medicine and Surgery, 1918. Licensed in California in 1918. Dr. McCullough was a member of the Alameda-Contra Costa Medical Association, the California Medical Association, and a Fellow of the American Medical Association.



NATHANSON, MORRIS H. Died in Los Angeles, April 24, 1952, aged 59. Graduate of the University of Minnesota Medical School, Minneapolis, 1919. Licensed in California in 1935. Dr. Nathanson was a member of the Los Angeles County Medical Association, the California Medical Association, and a Fellow of the American Medical Association.



RIGGLE, OLIVER. Died in Lodi, April 19, 1952, aged 69. Graduate of the University of Michigan Homeopathic Medical School, Ann Arbor, 1919. Licensed in California in 1919. Dr. Riggle was a member of the San Joaquin County Medical Society, the California Medical Association, and a Fellow of the American Medical Association.



WAGNER, LOUISE D. Died in Santa Barbara, April 2, 1952, aged 57. Graduate of Rush Medical College, Chicago, 1920. Licensed in California in 1921. Dr. Wagner was a member of the Los Angeles County Medical Association, the California Medical Association, and a Fellow of the American Medical Association.



# Questions and Answers about C. P. S.

**Question:** Do any C.P.S. female employee members still have the old form of medical maternity benefits—i.e., where C.P.S. payment for the physician's service is not limited to \$50.00?

**Answer:** Yes, a certain number of C.P.S. members (indicated by Code 1 in the two-visit-deductible space on identification cards) do have maternity benefits which are not limited by the \$50 indemnity. In the main, these members belong to the C.S.E.A. (California State Employees' Association) group or to one of the extended benefits groups. Necessarily, of course, they are female *employee* members. In these cases, the C.P.S. payment to the physician for his services (prenatal, delivery and postnatal) is \$100, which constitutes full payment (except for the first two visits) for persons who are under the income ceiling. Balance charges may be made to persons who are over the ceiling.

For the great majority of female employee members, however, C.P.S. payment for maternity services is limited to \$50 and this amount is intended as an allowance toward the physician's total fee. For these members, balance charges are permitted whether the member is under or over the income ceiling.

**Question:** What does C.P.S. mean by the term "contract year"?

**Answer:** A contract year, for C.P.S. purposes, constitutes one year from the original effective date of the member's enrollment and each succeeding twelve months' period during which the member maintains his membership in good standing; or it is one year from the date the member's coverage was converted from the old to the new C.P.S. contract and each succeeding twelve months' period of membership in good standing.

The date of the contract year is not necessarily the same for all members of a family. For example, an employee member may enroll a dependent at some date following the time when he joined C.P.S.

**Question:** How may the physician know to what extent a C.P.S. patient has utilized the yearly \$25.00 and \$10.00 allowances for x-ray and laboratory services, and also when the allowances will be renewed?

**Answer:** The following procedure has been established so that physicians will know the status of a C.P.S. patient's x-ray and laboratory allowances: When a physician member, who performs these services in his own office, submits his bill to C.P.S., he is sent a form which indicates (1) the amounts which will be paid by C.P.S.; (2) the amounts of the \$25 and \$10 allowances which remain; and (3) the date when the allowances will be renewed.

**Question:** What are the new "2827" forms and how do they affect the physician's handling of veteran cases under the Home Town Care Program?

**Answer:** The "2827" is a Veterans Administration form, which should be used whenever prompt treatment is not necessary. It is designed to supplant the C.P.S. Form 52 in new cases, i.e., veterans who apply for treatment of a service-connected disability for the first time, or old cases in which the veteran requests treatment from a new physician or has moved to his present location from another area. Form 2827 may be obtained by the veteran from the nearest VA office or from any County Veterans Service Officer.

When a request on the 2827 form has been received and approved by the VA, both the veteran and the physician (whose services have been requested by the veteran) are notified and a first authority for treatment is mailed to the physician. After issuance of the first authority, the case is handled routinely—i.e., there is no change in the monthly requests for continued authority (Form 53C), the billings (Form 53) or requests by telephone for amendments or emergencies.

In cases where prompt treatment is indicated, the physician should continue to use C.P.S. Form 52. Form 52 should also be used in rural districts where a trip to the nearest County Veterans Service Officer or VA office would create a hardship on the veteran.

**Question:** Two of my patients recently have asked me if C.P.S. members in good standing may continue their membership after reaching age 65. What is the answer?

**Answer:** C.P.S. does not cancel membership of members when they attain a certain age. Once a member has been enrolled, he may continue membership for life. The only reason C.P.S. membership is ever cancelled is because of non-payment of dues.

C.P.S. does observe certain underwriting rules which may prevent persons over 60 years of age from becoming members. But these rules have no effect on persons who have already enrolled.

**Question:** Are fees paid under the Veterans Program considered full fees, regardless of the veteran's income?

**Answer:** Yes. If the veteran is treated for a service-connected disability, the fee paid by the Veterans Administration (through the C.P.S.-VA home town care program) is the full fee, regardless of the veteran's income. Physicians are not permitted to make additional charges for any procedure authorized and paid for by the VA.

# NEWS and NOTES

## NATIONAL • STATE • COUNTY

### ALAMEDA

The 1952 Cancer Conference of the Alameda-Contra Costa Medical Association, in cooperation with the California Medical Association Cancer Commission and the California Division of the American Cancer Society, will be held the evening of Monday, June 16, in the Oakland Board of Education Building, Second Avenue and East Tenth Street. The program will begin at 8:15 p.m.

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Dr. Herbert M. Evans, director of the Institute of Experimental Biology at the University of California, has been selected as the winner of the Passano Foundation award for 1952. The award, carrying with it a \$5,000 prize, is made to encourage medical research, especially that which has clinical application.

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Dr. Clifford Sweet, for 30 years chief of staff of Children's Hospital of the East Bay in Oakland, was honored by the medical staff there on May 21, 22, and 23, with the inauguration of the "Clifford Sweet Clinics and Lecture-ship." The event opened ceremonially with the unveiling of a new portrait of Dr. Sweet by Spencer Macky, president of the California College of Arts and Crafts in Oakland. The first lecturer was Dr. Irvine McQuarrie, professor and head of the department of pediatrics, University of Minnesota. It is planned to make the Sweet Clinics and Lecture-ship an annual event.

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Dr. David Van der Slice, assistant director of health services for the Oakland public schools, was elected president-elect of the California Division of the American School Health Association at the annual meeting of the organization in Los Angeles in April.

### MARIN

Dr. Charles D. Marple of San Rafael, assistant clinical professor of medicine at the University of California School of Medicine, recently was appointed medical director of the American Heart Association. Dr. Marple will administer the research policies and the scientific and physician education programs of the Association.

### LOS ANGELES

Dr. Gordon E. Goodheart, for the past two years director of medical extension education at the University of Southern California School of Medicine, recently was appointed associate dean of the school.

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Dr. Louis J. Regan and Dr. Frederick D. Newbarr, both of Los Angeles, recently were named to official positions in the American Academy of Forensic Medicine at the annual meeting of the organization in Atlanta. Dr. Regan, who holds degrees in both medicine and law and is legal adviser to the Los Angeles County Medical Association, was elected president of the academy, and Dr. Newbarr, head of

the recently expanded department of forensic medicine at the University of Southern California, was appointed chairman of the academy's southwestern regional committee.

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Appointment of Dr. A. F. Rasmussen as professor of infectious diseases at the University of California at Los Angeles School of Medicine was announced last month by Dr. Stafford L. Warren, dean of the School of Medicine. Formerly of the University of Wisconsin Medical School, Dr. Rasmussen will serve as chief of the division of virology.

### SAN FRANCISCO

Dr. W. E. Carter, who recently retired as director of the outpatient clinics at the University of California Hospital, will speak on "Our Traditions" at the annual Gold-Headed Cane Ceremony of the School of Medicine. The ceremony will be held at 8 p.m. in Toland Hall, University of California Hospital, on June 18, 1952. Each year a gold-headed cane is awarded to the member of the graduating class who has shown the greatest interest in the welfare of his patients throughout his years in the School of Medicine. The award is designed to emphasize that the art of medicine is equally important in practice as knowledge of the science of medicine.

A similar cane is also presented to the physician selected to address the graduating students. This year, Dr. Langley Porter, former dean of the School of Medicine, will pass along to Dr. Carter the gold-headed cane he received as speaker at a previous ceremony. The senior student chosen by his classmates and the faculty of the Division of Medicine for his outstanding qualities will receive a cane from the hand of Dr. H. Donald Grant of Oakland, who won it some years ago.

### SANTA CLARA

Dr. Charles L. Ianne was elected president and Dr. Sydney Thomas vice-president of the Santa Clara County Tuberculosis Association at the annual meeting of the organization in May.

### GENERAL

Officers of the California Heart Association, elected April 30, 1952, are: President, Dr. Lewis T. Bullock, Los Angeles; vice-president, Dr. George C. Griffith, Pasadena; secretary, Dr. Arthur R. Twiss, Oakland; treasurer, Dan White, San Francisco. The board of directors for 1952-55 is: A. O. Altman, Los Angeles; Dr. Francis L. Chamberlain, San Francisco; Dr. James Dalton, Santa Barbara; Dr. William D. Evans, North Hollywood; Dr. Herbert Jenkins, Sacramento; Dr. Norman B. Leet, Oakland; Dr. Edgar Maurer, Los Angeles; Dr. Lowell A. Rantz, San Francisco; Dr. Edward C. Rosenow, Los Angeles; Dr. John J. Sampson, San Francisco; Gerald Stuttsman, Fresno; Ray Wiser, Berkeley; Dr. Richard Dickman, Bakersfield. Named to fill unexpired terms were Philip Landis and C. J. Haggerty, both of San Francisco.

## POSTGRADUATE EDUCATION NOTICES

### UNIVERSITY OF CALIFORNIA SCHOOL OF MEDICINE

#### Psychiatry and Neurology—The Langley Porter Clinic.

Date: August 25 through October 31, 1952, ten weeks, full time.

Fee: Fee for the course is \$200.

The course is particularly designed to prepare psychiatrists and neurologists for taking the examinations of the American Board of Psychiatry and Neurology.

#### Conference on General Surgery—Toland Hall, University of California Hospital.

Date: September 8 through 12, 1952.

Fee: \$75.00.

This course is offered for the purpose of stressing the newer concepts, methods of diagnosis, treatment, and techniques in surgery. Instruction will consist of didactic periods, panel discussions and actual *Operative Demonstrations*. Class limited to 50.

#### Ophthalmology—Toland Hall, University of California Hospital.

Date: September 15 through 20, 1952.

This is a course for specialists. Group instruction with demonstration of patients will be given twice daily.

Contact: Stacy R. Mettier, M.D., Head Postgraduate Instruction, Medical Extension, University of California Medical Center, San Francisco 22.

### STANFORD UNIVERSITY SCHOOL OF MEDICINE

#### Postgraduate Courses for Practicing Physicians

Date: September 15-19, 1952.

All-Day Courses: Internal Medicine and Therapeutics; General Surgery and Surgical Anatomy; Cardiology.

Morning Courses: General Medicine; Fractures and Trauma to Soft Tissues; Obstetrics and Gynecology; Dermatology.

Afternoon Courses: Proctology; Pediatrics; Psychiatry; Arthritis and Rheumatic Diseases.

Fee: \$75.00 for the combination of morning and afternoon course, or the all-day course (not covered by veterans' educational benefits).

Registration limited: Each physician may register for one morning and one afternoon course or one all-day course.

Contact: Dean, Stanford University School of Medicine, 2398 Sacramento Street, San Francisco 15, California.

### UNIVERSITY OF CALIFORNIA SCHOOL OF PUBLIC HEALTH

#### Health Aspects of Survival—A Workshop for Teachers and Students of Public Health—159 Forestry Building, University of California, Berkeley.

Date: June 23 to July 3, 1952.

Fee: \$30.00.

The School of Public Health and the University Extension, with the cooperation of the California State Civil Defense Organization, offer teachers and students of health a Workshop. This year's session has been expressly designed to provide appropriate objectives and scientific materials for instruction of the general college and high school student. This undertaking has been endorsed by state departments of Education, Public Health, and Civil Defense in most of the Mountain and Pacific states. Two units of credit.

For further information write to the Department of Conferences and Special Activities, University Extension, University of California, Berkeley 4.

### UNIVERSITY OF CALIFORNIA AT LOS ANGELES SCHOOL OF MEDICINE

#### Symposium on Hypnosis

Date: June 25, 26, 27, 1952.

Fee: \$50.00. Reduced fee \$25 for students now working toward graduate degrees in psychology or psychiatry.

Chairman: Roy M. Dorcus, Ph.D.

Guest Lecturers: Milton H. Erickson, formerly Director Psychiatric Research and Training, Wayne County General Hospital; Associate Professor of Psychiatry, Wayne University School of Medicine, Detroit, Michigan; now, practicing Psychiatrist, Phoenix, Arizona.

Frank A. Pattie, Ph.D., Professor Psychology, University of Kentucky.

Frank Kirkner, Ph.D., Chief, Clinical Psychology, Veterans Administration Hospital, Long Beach.

Discussants: Lester F. Beck, Ph.D., James S. L. Jacobs, M.D., Seymour Pollack, M.D., James H. Rankin, M.D., Charles O. Sturdevant, M.D., Eugene Ziskin, M.D.

Contact: Thomas H. Sternberg, M.D., Head of Postgraduate Instruction, Medical Extension University of California, Los Angeles 24, California.

### UNIVERSITY OF SOUTHERN CALIFORNIA SCHOOL OF MEDICINE

#### Internal Medicine—Course 830—Los Angeles County Hospital.

Date: September 15, 1952 through June 1, 1953, full time.

Fee: Fee for the course is \$750. Mail check to University of Southern California, School of Medicine, Department of Internal Medicine, Box 158, 1200 North State Street, Los Angeles 33. Course limited to eight students; applications will be accepted until July 15, 1952.

#### Intensive Review of Internal Medicine

Date: September 15 through September 26, 1952—8:30 a.m. to 12:30 p.m., Monday through Friday.

Fee: \$50.00; applications accepted until August 1, 1952.

This course is offered for students preparing to take examination for the American Board of Internal Medicine.

Contact: Donald Petit, M.D., Assistant Professor of Medicine.

## BOOK REVIEWS

**URINE AND URINARY SEDIMENT—A Practical Manual and Atlas**—Richard W. Lippman, B.S., M.D., Research Associate, Institute for Medical Research, Cedars of Lebanon Hospital, Los Angeles. Charles C. Thomas, Publisher, Springfield, 1952. 124 pages, 61 figures, 56 in color. \$7.50.

As stated in the author's foreword, the principal original contribution of this monograph lies in the presentation of a number of photographic reproductions in color of the urinary sediment. These reproductions should prove highly valuable in the teaching of medical students and laboratory technicians, while more experienced microscopists would do well to examine the figures carefully for what might be thought of as a postgraduate correspondence course. The author also performs the badly needed service of bringing up to date the methods for performing the "Addis Count" in a simple fashion, and in general adheres to the methods and interpretations of Thomas Addis (with whom he worked). In addition, one finds both theoretical and practical information on proteinuria and many other urinary abnormalities; a large section is devoted to details of technique in virtually every test performed on urine in clinical laboratories. The monograph also contains systematic discussions of the formed elements in the sediment and of urinary findings in disease. The work should find a place in every laboratory of clinical pathology and school of medicine.

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**HUMAN BIOCHEMISTRY—3rd Edition**—Israel S. Kleiner, Ph.D., Professor of Biochemistry and Director of the Department of Biochemistry, New York Medical College. 83 illustrations and five color plates. The C. V. Mosby Company, St. Louis, 1951. 695 pages. \$7.00.

Kleiner's volume on Human Biochemistry appears to be an acceptable textbook of the subject on the undergraduate level. It is simple and direct in presentation. The text is arranged in the usual descriptive format with emphasis placed on the historical development and significance of the topics. The subject matter of the various chapters is introduced in a matter of fact manner without adequate reference to basic biologic and clinical principles. The chapters dealing with applied biochemistry, especially in regard to the physiology of digestion, vitamins and foods, are good. There is an excellent chapter on the composition and nutritive importance of milk. The chapters on mineral metabolism and the urine constitute excellent introductions into the subject matter of these two important phases of biochemistry. The section on blood, as well as that on hormones, could have been broadened with profit. Some of the illustrative clinical material could have been deleted with advantage. The bibliography appended to each chapter is relatively complete. On the whole the book is commendable for the purposes of the author.

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**SPATIAL VECTOR ELECTROCARDIOGRAPHY — Clinical Electrocardiographic Interpretation**—Robert P. Grant, M.D., and E. Harvey Estes, Jr., M.D. The Blakiston Company, Philadelphia, 1951. 149 pages. \$4.50.

This original and interesting book presents a clinical method for interpreting in vector rather than scalar form the standard and unipolar electrocardiographic leads customarily used today. The coverage of the subject is not meant to be complete—only the normal and certain abnormal conditions of the ventricles are discussed. The introductory chapters are concerned with explaining in a general way

the application of vector principles to the electrical activity of the heart. The authors have carefully avoided highly technical terminology and have succeeded in presenting their material in an unusually well-written, simple style. The interrelations between the standard and unipolar limb leads and the feeling for the three-dimensional quality of the heart's electrical field are particularly well expressed. The unwary might have difficulty in separating fact from hypothesis at times due to the simple dogmatic style which contributes so much to the clarity of the presentation. There are several warnings about this in the text itself, however.

The method recommended for the actual interpretation of electrocardiograms is not such a happy proposition, unfortunately. The present method involves over-simplifications which lead to serious inaccuracies. The interpretations are mainly based on the determination of the spatial orientation of "mean QRS and T vectors." These mean spatial vectors are determined by a method which is reliable only when the corresponding actual vectorcardiographic QRS and T loops are roughly elliptical in shape with the isoelectric point quite near one end of the ellipse. Frequently this is not the case, particularly with abnormal loops, but one cannot readily determine the existence of this condition just from studying the electrocardiogram. To discover it one must resort to actual vectorcardiography or to the same tedious plotting methods which have spoiled the clinical usefulness of previously published methods for deriving vectorcardiograms from electrocardiographic leads.

It is very unfortunate that the authors did not check their findings against the results of actual vectorcardiographic study of their case material before publishing this book. They might have avoided such pitfalls as the omission of the important concept that not only the stressed "dead zone 0.04 vector" is important in the detection of myocardial infarction but that significant spatial shifts of the entire QRS loop occur, the rather incomplete and somewhat inaccurate discussion of the differentiation of left ventricular hypertrophy from left bundle branch block (p. 73), and the unsatisfying explanation offered for the "isolated T negativity" phenomenon (p. 47). In explaining the last, the authors suddenly abandon all the vector theory they had previously expounded: one wonders if the phenomenon doesn't result merely from the existence of a non-elliptical T loop. The precordial leads are used without much allowance being made for the fact that they do not lie strictly in the horizontal plane and lie at different distances from the heart. As a result, the increased voltages found in these leads are uncontrolled, the closer areas of the heart being unduly represented. Because of this one must remember that the spatial angle data presented cannot be compared precisely with information derived from actual vectorcardiography.

Nevertheless, much of what was written seems sound, and the many practical applications of vector principles are thought-provoking and enlightening. The book is a fecund source of ideas that deserve further experimental exploration. In summary, the book can be highly recommended as one of very few lucid, non-technical expositions of the application of vector principles to the electrical activity of the heart; as a clinical method for assisting in the interpretation of electrocardiograms it has considerable merit but too many faults to be generally useful. Those interested in investigating this aspect of the subject further would probably do better to turn to vectorcardiography.

**CLINICAL ALLERGY—A Practical Guide to Diagnosis and Treatment—Second Edition**—Samuel J. Taub, M.D., F.A.C.P., Professor of Medicine, and Chairman of the Department of Allergic Diseases, Chicago Medical School. Paul B. Hoeber, Inc., 49 East 33rd St., New York, 1951. 276 pages. \$4.50.

Succinct discussion of the immunochemistry of allergy, the nature of antibodies, antigens, and haptens, the mechanism of the hypersensitive reaction and the results and location of the antibody-antigen cellular reaction, are in the first four quite brief chapters of this book.

Discussion of inhalant and, to a lesser extent, food allergies follows. Methods of diagnosis and treatment are outlined. More consideration of the negative skin reaction in pollen and especially in food-sensitive patients would be helpful. The student must know, moreover, that pollen-sensitive patients may give reactions due to past or potential allergy, or to non-specific substances in the extracts, or may give no reactions to important allergenic pollens. In the latter case, the conjunctival test is advised which also may be negative. The choice of pollens for treatment needs additional discussion, depending as it does primarily on the patient's history correlated with the pollination seasons and secondarily on the skin reactions obtained.

In the section on the diagnosis and treatment of perennial nasal allergy, bronchial asthma, and atopic dermatitis, major attention is given to inhalant allergy including that to pollens, animal emanations, miscellaneous inhalants, and house dust. There is special emphasis on cottonseed as an inhalant. The open mind about allergens in cottonseed and other vegetable oils is approved by this reviewer. Such allergy is interestingly stressed in atopic dermatitis, possibly from the author's experience before the last war. Fungus inhalant allergy is considered with approved reserve.

Many allergists will be disappointed in the information about food allergy. The frequency of food allergy in patients with negative skin tests could be emphasized. Although those negative tests are noted, food allergies in summarized cases are only determined by skin testing, especially by the fallible intradermal and in one case by the passive transfer method. There is insufficient consideration of food allergy in atopic dermatitis, allergic headaches, gastrointestinal allergy, joint and urogenital allergy, and the quite common allergic toxemia. The trial diets in the appendix detail recent elimination diets of Rowe. References to them in 1944 and 1950 would be more helpful than the original reference in 1928. And throughout the book, references to important texts and previous and recent contributions profitable for the student to read and refer to would be important.

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**RELATION OF PSYCHOLOGICAL TESTS TO PSYCHIATRY.** Edited by Paul H. Hock, M.D., New York State Psychiatric Institute; College of Physicians and Surgeons, Columbia University; and Joseph Zubin, Ph.D., New York State Psychiatric Institute, Department of Psychology, Columbia University. The Proceedings of the Fortieth Annual Meeting of the American Psychopathological Association, held in New York City, June 1950. Grune and Stratton, New York, 1952. 301 pages. \$5.50.

It would be very nice indeed if there were a readily available source of information to the physician as to what he could expect in the way of useful information when he sends his patients for psychological tests. This book is not, however, the answer to this need. Rather it is the proceedings of the 1950 meeting of the American Psychopathological Association. As such, it should be of interest to the specialist in psychiatry, but since the work reported is now two years old one would rather suspect that it was already known to the workers in this field. It is not a book that would be helpful to the uninitiate.

**MONOGRAPHS ON SURGERY—1952.** B. Noland Carter, M.D., Ph.D., Editor, Professor of Surgery, University of Cincinnati. The Williams and Wilkins Company, Baltimore, 1952. 430 pages, \$12.50.

This is the third volume of "Monographs on Surgery" and represents the changing policy from Nelson's Loose Leaf Surgery with yearly supplements to a series of monographs on timely subjects each year. If one saves these monographs, which are published in book form, an up-to-date series of articles, each well done by an expert in the field, will be available as a reference source to the surgeon rather than the previous systems of surgery. Necessarily the scope of each book of monographs must be rather diversified, and this is true of the present volume.

There are essentially sixteen excellent articles in monograph style in this present volume. Six of the articles deal with a symposium on Urinary Incontinence in the Female, and each of them is admirably written and illustrated by an expert. The orthopedic section comprises four articles: one on internal fixation of fractures of long bones, another on intrascapular fractures of the femoral neck, a third on aseptic necrosis of the femoral head, and a fourth on arthroplasty. There are two articles on urology: (1) congenital pelvic and urethral dilatation, and (2) renal neoplasms. The remaining articles are devoted to surgery of the large arteries, operation (for neoplasms) of the pancreas, management of acute chest injuries, and radioactive iodine in the diagnosis and treatment of thyroid disease.

With surgery divided into the specialties, and with the content of the monographs being of a character to appeal to a specialist rather than to a general practitioner, it is unlikely that any one surgeon will be interested in all the articles contained in the present volume. Depending upon one's surgical inclinations, therefore, the articles will prove excellent or useless. One wonders if it might not be advisable from the standpoint of the practicing surgeon to have each yearly monograph be a symposium in a given specialty, following the lines more or less adhered to in everyday practice of surgery. For a total of sixteen articles two specialties might be included, such as orthopedics and neurosurgery, or chest and vascular surgery. With the present contents the publishers theoretically hope to sell more books to a wider variety of surgeons, but one must wonder if it does not result in fewer surgeons buying the volume, and accordingly, permitting a series of excellent articles to pass unstudied and unread by the specialists who are seeking such material in their respective fields.

If the scope of the table of contents appeals to your interests in surgery the present "Monographs in Surgery" is worth securing for your library. The book is excellently printed and illustrated and the articles are excellent.

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**CLINICAL PRACTICE IN INFECTIOUS DISEASES—For Students, Practitioners and Medical Officers.** E. H. R. Harries, M.D., Lond., F.R.C.P., Formerly Medical Superintendent Infectious-Diseases Hospitals Service, London County Council; and M. Mitman, M.D., Lond., F.R.C.P., Consultant Physician and Medical Superintendent, River Hospitals, Joyce Green, Dartford. Fourth Edition. The Williams and Wilkins Company, Baltimore, 1951. 717 pages. \$6.50.

Harries and his associates have prepared an excellent textbook containing sound descriptions of the communicable infectious diseases. They are probably not better than those to be found in any standard American textbook of medicine or pediatrics. Management of the various disorders is considered within the setting of British use of antimicrobial agents and public health regulations. For this reason the book will be of very little value to students and physicians in this country.

**STANDARD NOMENCLATURE OF DISEASES AND OPERATIONS—Fourth Edition.** Richard J. Plunkett, M.D.; Editor, and Adaline C. Hayden, R.R.L., Association Editor. Published for the American Medical Association. The Blakiston Company, Philadelphia, 1952. 1,034 pages. \$8.00.

"Standard Nomenclature of Diseases and Operations" appeared in its fourth edition in January 1952. The work has been expanded to include a 187-page appendix which attempts to correlate the "Standard" diagnoses and code numbers with diagnoses and code numbers of the "International Statistical Classification of Diseases, Injuries, and Causes of Death." The International list numbers have been inserted parenthetically throughout the body of the book and by reference to the appendix the code numbers of the two systems may be cross-indexed.

Sections on tumor classifications, on diseases of the hemic and lymphatic systems, and psychiatric diagnostic terminology have been broadly revised under competent editorship in the light of newer knowledge.

The Supplemental Terms lists do not in this edition follow directly after the categories they subserve but are grouped together in one section. Most of these lists have been increased and improved. A notable exception is the list of Supplemental Terms of the endocrine system.

The list of eponyms has disappeared as such and these now appear in the general index of nomenclature. This is a more handy arrangement. The familiar names of Henoch and Schönlein have said farewell as well as Felty's syndrome. Eisenmenger's syndrome appears for the first time along with Chiari's, Letterer-Siwe's, and Brill-Symmers.

There are several examples of improved proofreading. Déjerine has throughout now acquired its acute accent, "Monckberg" has found the additional *e* it needed, and "Friederichsen" of Waterhouse-Friederichsen has lost the *e* it did not need. But although Fröhlich is now Froelich, Köhlers is still Köhlers.

If it becomes necessary in the future to expand this book once more, it is suggested that the present appendix be made into a separate volume. The book is maximally large now for handy desk reference and few of those who use it frequently have need for reference to the International classification.

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**UROLOGICAL PATHOLOGY.** Peter A. Herbut, M.D., Professor of Pathology, Jefferson Medical College, and Director of Clinical Laboratories, Jefferson Medical College Hospital, Philadelphia. Lea & Febiger, Philadelphia, 1952. Two volumes, 1,222 pages, 527 illustrations, two in color. \$24.00.

This long (1,222 pages in two volumes) work is more a pathologist's summary of the whole field of urology than (ideally) an exhaustive description of the anatomic and pathologic changes in urologic disease. Half the space is given up to non-critical review of the literature of the last 25 years and too little is devoted to anatomicohistologic detail, which has been available only in German works. The clinical material (better covered in standard texts) could profitably be replaced by presentation of the physiologic-biochemical implications and correlations of the pathologic processes.

The fourteen chapters deal successively with the various organs of the urinary and genital tracts, a convenient arrangement for the practicing doctor but entailing some repetition and making the interrelationships less distinct (as for instance in obstructive disease which often affects the tract as a whole). Each organ is discussed completely and the references will be valuable.

These volumes are recommended only as a reference work for most students and physicians, but would be a worthwhile addition to the libraries of the studious urologist.

**TONSIL AND ALLIED PROBLEMS.** Roy H. Parkinson, M.D., F.A.C.S., Chief of Eye, Ear, Nose and Throat Department, St. Joseph's Hospital, San Francisco. The Macmillan Company, New York, 1951. 432 pages. \$12.00.

The need for an up-to-date text on the tonsils and adenoids seems obvious when it is considered that, as the author states in the introduction, "There are more tonsillectomies performed than any other operation known," and that many years have elapsed since the appearance of a complete treatise on the subject.

The anatomy, embryology and histology of the tonsils and of the adjoining tissues are given, including well detailed descriptions of the musculature of the throat, the potential spaces around the tonsils, the adenoids, the blood supply and the nerve supply.

All known diseases of the tonsils are discussed, together with their diagnosis and treatment.

The chapter on indications for tonsillectomy is concise yet complete. The author rightly decries the promiscuous removal of all children's tonsils. He believes the tonsils definitely can constitute a focus of infection, but that such is not so frequently the case as has been thought in the past.

The technique of tonsillectomy and of adenoidectomy is treated at length. All methods are described, together with the author's modifications based on his many years' experience and on many thousand cases. In his opinion, however, the choice of technique is not important so long as the tonsils are completely removed without injury to the musculature, particularly to the pillars of the fauces.

Postoperative care is discussed fully. The author's postoperative liquid medication seems better than aspirin (plain) although he states he never has observed aspirin to cause bleeding.

Postoperative complications are well covered with exception of sudden death during or immediately after operation. Although rare, deaths do occur. In the reviewer's opinion a desirable addition would be a detailed account of the causes of such deaths.

This book has been designed to aid not only the general practitioner but also the specialist. It is well written. The easy, simple style makes its reading a pleasure. The illustrations, 250 in number, are excellent and depict all points covered in the text. Its perusal is worth the time of anyone interested in the tonsil problem. The physician starting in this field should consider this text "required reading." The specialist would do well to add it to his reference library.

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**SERUM SICKNESS.** C. Frh. von Pirquet, M.D., and Bela Schick, M.D. Translated by Bela Schick, M.D. The Williams and Wilkins Company, 1951. 130 pages. \$3.50.

Immunologists, allergists, and all physicians with an interest in the history of their profession will be delighted that this great monograph has at last been translated into English by one of the authors. It is inconceivable that 46 years could have been allowed to elapse before this was accomplished.

The modern concept of the role of allergic reactions in the causation of human disease may be said to have been conceived in the mind of von Pirquet. Little has been added to the clinical observations, experimental results, and theoretical considerations set down in this book.

The rapid disappearance of the acute infectious diseases as a cause of human disability has brought into prominence a large group of disorders in which inappropriate immunologic reactions probably are important in pathogenesis. Notable examples are rheumatic fever and periarteritis nodosa. The enquiring physician might well begin his consideration of this subject by reading "Die Serumkrankheit" in this excellent translation.





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*for their varying vitamin needs*



## MEAD'S 3 versatile "VI-SOLS"

**Pleasant tasting...**  
superior flavors assure patient acceptance

**Clear, light texture...**  
non-sticky; flow easily from dropper

**Excellent dispersibility...**  
disperse instantly in fruit juice or water;  
mix readily with formula

**Highly stable...**  
stable at room temperature;  
may be autoclaved with formula

**Easy, accurate dosage measurement...**  
specially designed, easy-to-read dropper  
assures accurate dosage

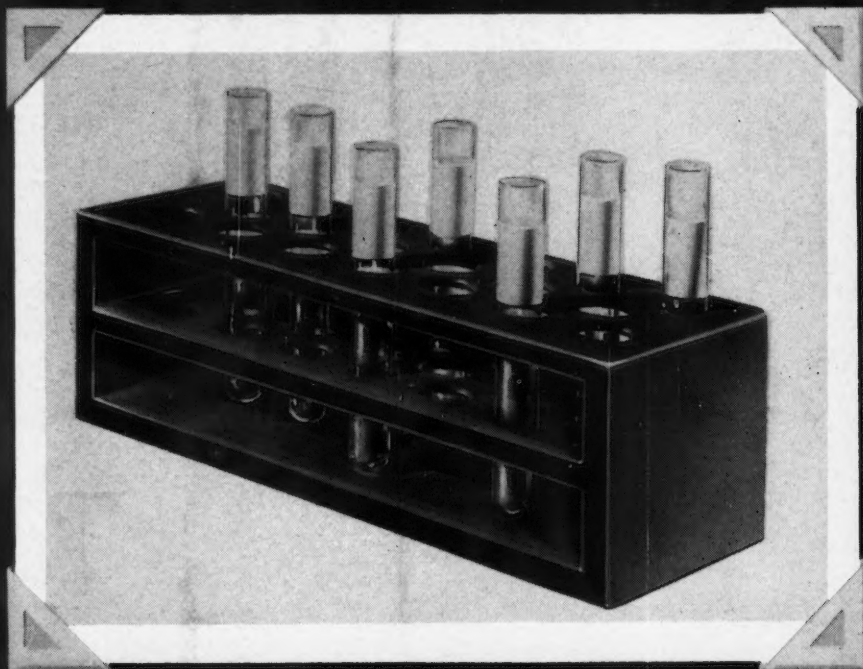
**Convenient...**  
may be given in formula, fruit juice  
or water, or dropped into mouth



	Vitamin A	Vitamin D	Ascorbic Acid	Thiamine	Riboflavin	Niacinamide
<b>POLY-VI-SOL</b> Each 0.6 cc. supplies	5000 Units	1000 Units	50 mg.	1 mg.	0.8 mg.	5 mg.
<b>TRI-VI-SOL</b> Each 0.6 cc. supplies	5000 Units	1000 Units	50 mg.			
<b>CE-VI-SOL</b> Each 0.5 cc. supplies			50 mg.			

**MEAD'S**

MEAD JOHNSON & COMPANY • EVANSVILLE 21, IND., U.S.A.



*Cutter portrait of an allergy patient*

## *Get* personal help with allergies

Cutter's test and treatment service offers a simple, comprehensive method of sensitivity identification and therapy *by mail*.

The test set includes a chart for recording patient's reaction which may be mailed to Cutter Allergy Department for preparation of an *individual* treatment set.

Whether the offender is pollen, protein, or "maverick" the staff is ready to help select the treatment for greatest relief. Write Cutter for detailed information. Cutter Laboratories, Berkeley, California.



